U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
PB-293 731

Field Tests of Industrial Stoker Coal-fired Boilers for Emissions Control and Efficiency Improvement - Site A (Data Supplement)

KVB, Inc., Minneapolis, MN

Prepared for

Industrial Environmental Research Lab., Research Triangle Park, NC

Dec 78

PB 293731

ABMA American Boiler Manufacturers Association — 1500 Wilson Boulevard, Arlington VA 22209

DoE United States Department of Energy — Division of Power Systems, Energy Technology Branch, Washington DC 20545

EPA U.S. Environmental Protection Agency, Office of Research and Development — Industrial Environmental Research Laboratory, Research Triangle Park NC 27711

EPA-600/7-78-136b
December 1978

Field Tests of Industrial Stoker Coal-fired Boilers for Emissions Control and Efficiency Improvement - Site A (Data Supplement)

Interagency Energy/Environment R&D Program Report

REPRODUCED BY
NATIONAL TECHNICAL INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/7-78-136b		PB293731

4. TITLE AND SUBTITLE	5. REPORT DATE
Field Tests of Industrial Stoker Coal-fired Boilers for Emissions Control and Efficiency Improvement--Site A (Data Supplement)	December 1978
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
J.E. Gabrielson, P.L. Langsjoen, and T.C. Kosvic	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
KVB, Inc. 6176 Olson Memorial Highway Minneapolis, Minnesota 55422	EHE624
	11. CONTRACT/GRANT NO.
	EPA-IAG-D7-E681 and DOE-EF-77-C-01-2609
12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
EPA, Office of Research and Development * Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	Supplement; 6-12/77
	14. SPONSORING AGENCY CODE
	EPA/600/13 and DoE

15. SUPPLEMENTARY NOTES IERL-RTP project officer is R.E. Hall. (*) Cosponsors are DoE (W.T. Harvey, Jr.) and the American Boiler Manufacturers Association.

16. ABSTRACT The supplement is a compilation of test data in greater detail than was practical in the final report. It provides details to other researchers who are interested in performing their own analysis. Readers are referred to the final report for: objectives; descriptions of the facility tested, coals fired, test equipment, and procedures; interpretations; and conclusions. The final report also contains data summaries not found in the supplement. The supplement contains panel board data for each test; detailed particulate, O2, CO2, CO, NO, SO2, and SO3 data; particle size distribution data; modified spoke spot data; and data on chemical analysis of the coal and coal size consistency.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Air Pollution	Improvement	Air Pollution Control	13B	
Boilers	Efficiency	Stationary Sources	13A	
Combustion	Flue Gases	Combustion Modification	21B	
Coal	Fly Ash	Spreader Stokers	21D	
Field Tests	Particle Size	Particulate	14B	
Dust	Nitrogen Oxides	Overfire Air	11G	07B
Stokers	Sulfur Oxides	Flyash Reinjection		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS (This Report)	21. NO. OF PAGES
Unlimited	Unclassified	279
	20. SECURITY CLASS (This page)	22. PRICE
	Unclassified	PC A13/A01

Form 2220-1 (9-73)

EPA-600/7-78-136b

December 1978

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Program Element No. EHE624

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Industrial Environmental Research Laboratory
Office of Energy, Minerals, and Industry
Research Triangle Park, NC 27711

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Research and Development
Washington, DC 20460

U.S. DEPARTMENT OF ENERGY
Division of Power Systems/Energy Technology Branch
Washington, DC 20545

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AMERICAN BOILER MANUFACTURERS ASSOCIATION
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FOREWORD

The purpose of this Data Supplement Volume is to document data in greater detail than was practical in the Final Technical Report.[1] It is intended to provide the necessary details to other researchers who are interested in performing their own analysis. Readers are referred to the contract final report for information as to objectives, description of facility tested and coals fired, test equipment and procedures, interpretations and conclusions. The Final Technical Report also contains data summaries not found in this volume.

The data in this volume are arranged by type (i.e., Panel Board Data, Particulate Data, etc.) and within each type by test number. Data summaries where they exist are at the front of each section. The boiler tested is referred to as Boiler A; as it is the first boiler tested under the program entitled, "A Testing Program to Update Equipment Specifications and Design Criteria for Stoker Fired Boilers."

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[1]Gabrielson, J. E., et al., "Field Tests of Industrial Stoker Coal-Fired Boilers for Emissions Control and Efficiency Improvement - Site A", EPA-600/7-78-136a, July, 1978.

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CONVERSION FACTORS

ENGLISH AND METRIC UNITS TO SI UNITS

To Convert From	To	Multiply By
in	cm	2.540
in^2	cm^2	6.452
ft	m	0.3048
ft^2	m^2	0.09290
ft^3	m^3	0.02832
lb	Kg	0.4536
lb/hr	Mg/s	0.1260
$lb/10^6$BTU	ng/J	430
g/Mcal	ng/J	239
BTU	J	1054
BTU/lb	J/kg	0.002324
BTU/hr	W	0.2929
J/sec	W	1.000
J/hr	W	3600
BTU/ft/hr	W/m	0.9609
BTU/ft/hr	J/hr/m	3459
$BTU/ft^2/hr$	W/m^2	3.152
$BTU/ft^2/hr$	$J/hr/m^2$	11349
$BTU/ft^3/hr$	W/m^3	10.34
$BTU/ft^3/hr$	$J/hr/m^3$	37234
psia	Pa	6895
$"H_2O$	Pa	249.1
Rankine	Celsius	C = 5/9R-273
Fahrenheit	Celsius	C = 5/9(F-32)
Celsius	Kelvin	K = C+273
Rankine	Kelvin	K = 5/9R

COAL FUEL ONLY

ppm @ 3% O_2 (SO_2)	ng/J	0.851
ppm @ 3% O_2 (SO_3)	ng/J	1.063
ppm @ 3% O_2 (NO)	ng/J	0.399
ppm @ 3% O_2 (NO_2)	ng/J	0.611
ppm @ 3% O_2 (CO)	ng/J	0.372
ppm @ 3% O_2 (CH_4)	ng/J	0.213

CONVERSION FACTORS

SI UNITS TO ENGLISH AND METRIC UNITS

To Convert From	TO	Multiply By
cm	in	0.3937
cm^2	in^2	0.1550
m	ft	3.281
m^2	ft^2	10.764
m^3	ft^3	35.315
Kg	lb	2.205
Mg/s	lb/hr	7.937
ng/J	$lb/10^6BTU$	0.00233
ng/J	g/Mcal	0.00418
J	BTU	0.000948
J/kg	BTU/lb	4.303
J/hr/m	BTU/ft/hr	0.000289
$J/hr/m^2$	$BTU/ft^2/hr$	0.0000881
$J/hr/m^3$	$BTU/ft^3/hr$	0.0000269
W	BTU/hr	3.414
W	J/hr	0.000278
W/m	BTU/ft/hr	1.041
W/m^2	$BTU/ft^2/hr$	0.317
W/m^3	$BTU/ft^3/hr$	0.0967
Pa	psia	0.000145
Pa	$"H_2O$	0.004014
Kelvin	Fahrenheit	F = 1.8K-460
Celsius	Fahrenheit	F = 1.8C+32
Fahrenheit	Rankine	R = F+460
Kelvin	Rankine	R = 1.8K

COAL FUEL ONLY

ng/J	ppm @ 3% O_2 (SO_2)	1.18
ng/J	ppm @ 3% O_2 (SO_3)	0.941
ng/J	ppm @ 3% O_2 (NO)	2.51
ng/J	ppm @ 3% O_2 (NO_2)	1.64
ng/J	ppm @ 3% O_2 (CO)	2.69
ng/J	ppm @ 3% O_2 (CH_4)	4.69

SI PREFIXES

Multiplication Factor	Prefix	SI Symbol
10^{12}	tera	T
10^{9}	giga	G
10^{6}	mega	M
10^{3}	kilo	k
10^{2}	hecto*	h
10^{1}	deka*	da
10^{-1}	deci*	d
10^{-2}	centi*	c
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a

*Not recommended but occasionally used

EMISSIONS UNITS CONVERSION FACTORS
FOR TYPICAL COAL FUEL (HV = 13,320 BTU/LB)

To Obtain \ Multiply by	% Weight In Fuel		lbs/10^6 Btu		grams/10^6 Cal		PPM (Dry @ 3% O_2)		grains/SCF (Dry @ 12% CO_2)	
	S	N	SO_2	NO_2	SO_2	NO_2	SOx	NOx	SO_2	NO_2
% Weight In Fuel — S	1		0.666		0.370		13.2×10^{-4}		1.48	
% Weight In Fuel — N				0.405		0.225		5.76×10^{-4}		.903
lbs/10^6 Btu — SO_2	1.50		1		(.556)		19.8×10^{-4}		(2.23)	
lbs/10^6 Btu — NO_2		2.47				(.556)		14.2×10^{-4}		(2.23)
grams/10^6 Cal — SO_2	2.70		(1.8)		1		35.6×10^{-4}		(4.01)	
grams/10^6 Cal — NO_2		4.44		(1.8)				25.6×10^{-4}		(4.01)
PPM (Dry @ 3% O_2) — SOx	758		505		281		1		1127	
PPM (Dry @ 3% O_2) — NOx		1736		704		391				1566
grains/SCF (Dry @ 12% CO_2) — SO_2	676		(.448)		(.249)		8.87×10^{-4}		1	
grains/SCF (Dry @ 12% CO_2) — NO_2		1.11		(.448)		(.249)		6.39×10^{-4}		

NOTE: 1. Values in parenthesis can be used for all flue gas constituents such as oxides of carbon, oxides of nitrogen, oxides of sulfur, hydrocarbons, particulates, etc.

2. Standard reference temperature of 530°R was used.

KVB 15900-521

SECTION 1.0

PANEL BOARD DATA

		Page
1.1	Control Room Data Sheet	2

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 1
Date: 9 Aug 77
Description: SO_x at multiclone outlet

Time of Reading	10:02	11:17	12:21		
Stm Integrator (x 3000 lb/hr)	267870	267949	268018		
Stm Flow (% of 3×10^5 lb/hr)	63	65	68		
FW Flow (% of 4×10^5 lb/hr)	49	51	53		
Air Flow (% relative)	55	67	58		
Stm Hdr Press (psig)	300	300	300		
Grate Temps No. 1	604	642	742		
(°F) 2	705	650	845		
3	686	673	840		
4	577	605	726		
5	627	639	766		
6	587	678	744		
Blr Out Gas Temp (°F)	598	623	608		
AH Out Gas Temp (°F)	440	459	451		
Econ Out Gas Temp (°F)	340	352	345		
Furnace Air Temp (°F)	342	347	351		
Feedwater Temp (°F)	263	268	266		
Front OF Air, Top/Bottom (in H_2O)	3.6/6.0	3.6/6.0	3.6/6.0		
Rear OF Air, Top/Bottom (in H_2O)	—/10.2	—/10.2	—/10.2		
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO	NO		
Blr Master Control (0-100%)	65	60	60		
Stoker Speed Control (0-100%)	65	60	60		
Air Flow Control (0-100%)	45	53	46		
Fur Draft Control (0-100%)	24	31	25		
Feedwater Control (0-100%)	49	50	52		
Stack Opacity (0-100%)	4.2	3.7	3.0		
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 2
Date: 10 Aug 77
Description: Effect of Excess O_2 on Gaseous Emissions

Time of Reading	14:35	14:50	15:09	15:25	16:22
Stm Integrator (x 3000 lb/hr)	269572	269587	269606	269621	269677
Stm Flow (% of $3x10^5$ lb/hr)	61	61	60.5	60	61
FW Flow (% of $4x10^5$ lb/hr)	49	49	49	49	49
Air Flow (% relative)	51	48	44	40	50.5
Stm Hdr Press (psig)	300	300	300	300	300
Grate Temps No. 1	767	769	789	777	654
(°F) 2	824	855	889	891	745
3	820	849	876	904	732
4	719	724	711	725	690
5	778	755	750	763	749
6	805	784	787	797	830
Blr Out Gas Temp (°F)	593	584	574	570	594
AH Out Gas Temp (°F)	442	437	431	428	442
Econ Out Gas Temp (°F)	337	335	332	330	336
Furnace Air Temp (°F)	352	354	355	357	354
Feedwater Temp (°F)	264	263	262	261	263
Front OF Air, Top/Bottom (in H_2O)					
Rear OF Air, Top/Bottom (in H_2O)					
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	NO
Blr Master Control (0-100%)	55	55	55	55	55
Stoker Speed Control (0-100%)	54	54	54	54	54
Air Flow Control (0-100%)	42	40	36	35	42
Fur Draft Control (0-100%)	20	18	15	14	20
Feedwater Control (0-100%)	50	50	50	50	50
Stack Opacity (0-100%)	3.0	3.0	2.8	3.7	3.0
COMMENTS:					

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CONTROL ROOM DATA
TEST LOCATION A

Test No.: 2
Date:
Description: Page 2 of 2

Time of Reading	4:37	4:51			
Stm Integrator (x 3000 lb/hr)	269692	269706			
Stm Flow (% of $3x10^5$ lb/hr)	62	61	61		
FW Flow (% of $4x10^5$ lb/hr)	50	49	49		
Air Flow (% relative)	53	58	63		
Stm Hdr Press (psig)	300	300	300		
Grate Temps No. 1	659	643	602		
(°F) 2	667	636	580		
3	680	624	593		
4	693	638	602		
5	728	699	674		
6	798	759	734		
Blr Out Gas Temp (°F)	599	603	608		
AH Out Gas Temp (°F)	446	448	451		
Econ Out Gas Temp (°F)	339	342	345		
Furnace Air Temp (°F)	354	351	348		
Feedwater Temp (°F)	264	265	266		
Front OF Air, Top/Bottom (in H_2O)					
Rear OF Air, Top/Bottom (in H_2O)					
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO	NO		
Blr Master Control (0-100%)	55	55	55		
Stoker Speed Control (0-100%)	54	54	54		
Air Flow Control (0-100%)	43	46	50		
Fur Draft Control (0-100%)	22	24	27		
Feedwater Control (0-100%)	51	51	50		
Stack Opacity (0-100%)		3.0	3.2		
COMMENTS:					

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CONTROL ROOM DATA
TEST LOCATION A

Test No.: 3
Date: 11 Aug 77
Description: Particulates at multiclone outlet

Time of Reading	11:46	13:58	14:54		
Stm Integrator (x 3000 lb/hr)	270818	270952	271008		
Stm Flow (% of $3x10^5$ lb/hr)	62	61	62		
FW Flow (% of $4x10^5$ lb/hr)	49	49	49		
Air Flow (% relative)	50	50	50		
Stm Hdr Press (psig)	298	300	300		
Grate Temps No. 1	593	747	750		
(°F) 2	572	818	889		
3	629	860	855		
4	621	796	781		
5	710	841	838		
6	796	817	724		
Blr Out Gas Temp (°F)	592	595	597		
AH Out Gas Temp (°F)	438	441	443		
Econ Out Gas Temp (°F)	336	338	338		
Furnace Air Temp (°F)	347	352	352		
Feedwater Temp (°F)	263	265	265		
Front OF Air, Top/Bottom (in H_2O)	3.6/5.6	3.6/5.6			
Rear OF Air, Top/Bottom (in H_2O)	—/9.7	—/9.6			
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	No	No			
Blr Master Control (0-100%)	56	54	55		
Stoker Speed Control (0-100%)	55	54	54		
Air Flow Control (0-100%)	42	42	42		
Fur Draft Control (0-100%)	20	20	20		
Feedwater Control (0-100%)	52	47	50		
Stack Opacity (0-100%)	3.0	2.8	2.9		
COMMENTS:					

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CONTROL ROOM DATA
TEST LOCATION A

Test No.: 4
Date: 17 Aug 77
Description: Particulates and Brink at multiclone outlet

Time of Reading	12:12	14:57	16:57		
Stm Integrator (x 3000 lb/hr)	278886	279050	279170		
Stm Flow (% of $3x10^5$ lb/hr)	62	62	63		
FW Flow (% of $4x10^5$ lb/hr)	52	50	53		
Air Flow (% relative)	67	67	67		
Stm Hdr Press (psig)	300	300	300		
Grate Temps No. 1	450	436	429		
(°F) 2	556	430	435		
3	669	460	446		
4	527	475	429		
5	579	558	449		
6	600	509	565		
Blr Out Gas Temp (°F)	623	625	628		
AH Out Gas Temp (°F)	459	460	462		
Econ Out Gas Temp (°F)	350	350	350		
Furnace Air Temp (°F)	348	350	351		
Feedwater Temp (°F)	270	270	270		
Front OF Air, Top/Bottom (in H_2O)	3.5/5.6	3.4/5.6	3.5/5.6		
Rear OF Air, Top/Bottom (in H_2O)	—/10.2	—/10.5	—/10.3		
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO	NO		
Blr Master Control (0-100%)	40	46	38		
Stoker Speed Control (0-100%)	40	46	37		
Air Flow Control (0-100%)	53	53	52		
Fur Draft Control (0-100%)	28	28	30		
Feedwater Control (0-100%)	51	54	52		
Stack Opacity (0-100%)	3.0	3.0			
COMMENTS:					

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CONTROL ROOM DATA
TEST LOCATION A

Test No.: 5
Date: 18 Aug 77
Description: Particulates at multiclone outlet

Time of Reading	11:54	12:48	13:42		
Stm Integrator (x 3000 lb/hr)	280367	280432	280496		
Stm Flow (% of $3x10^5$ lb/hr)	75	74			
FW Flow (% of $4x10^5$ lb/hr)	60	59.5			
Air Flow (% relative)	71	70			
Stm Hdr Press (psig)	300	300			
Grate Temps No. 1	460	439			
(°F) 2	472	501			
3	464	496			
4	474	470			
5	523	533			
6	658	690			
Blr Out Gas Temp (°F)	632	639			
AH Out Gas Temp (°F)	474	473			
Econ Out Gas Temp (°F)	360	360			
Furnace Air Temp (°F)	351	352			
Feedwater Temp (°F)	269	269			
Front OF Air, Top/Bottom (in H_2O)	3.8/5.9				
Rear OF Air, Top/Bottom (in H_2O)	—/10.9				
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO				
Blr Master Control (0-100%)	57	58			
Stoker Speed Control (0-100%)	57	57			
Air Flow Control (0-100%)	57	56			
Fur Draft Control (0-100%)	33	32			
Feedwater Control (0-100%)	57	56			
Stack Opacity (0-100%)	9.5	3.4			
COMMENTS:					

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CONTROL ROOM DATA
TEST LOCATION A

Test No.: 6
Date: 18 Aug 77
Description: Particulates at multiclone outlet

Time of Reading	15:35	16:26	16:58		
Stm Integrator (x 3000 lb/hr)	280630	280690	280727		
Stm Flow (% of $3x10^5$ lb/hr)	73	73	72		
FW Flow (% of $4x10^5$ lb/hr)	59	59	58		
Air Flow (% relative)	78	78	78		
Stm Hdr Press (psig)	300	300	300		
Grate Temps No. 1	480	507	468		
(°F) 2	496	553	545		
3	529	574	627		
4	577	537	588		
5	673	683	722		
6	610	645	607		
Blr Out Gas Temp (°F)	655	652	655		
AH Out Gas Temp (°F)	484	482	486		
Econ Out Gas Temp (°F)	365	380	375		
Furnace Air Temp (°F)	350	349	349		
Feedwater Temp (°F)	271	271	273		
Front OF Air, Top/Bottom (in H_2O)	4.0/6.3	4.0/6.1	3.9/6.1		
Rear OF Air, Top/Bottom (in H_2O)	—/11.5	—/11.5	—/11.2		
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	No	No	No		
Blr Master Control (0-100%)	62	63	60		
Stoker Speed Control (0-100%)	62	63	60		
Air Flow Control (0-100%)	65	63	65		
Fur Draft Control (0-100%)	40	40	40		
Feedwater Control (0-100%)	56	56	55		
Stack Opacity (0-100%)	21	22	16		
COMMENTS:					

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CONTROL ROOM DATA
TEST LOCATION A

Test No.: 7
Date: 19 Aug 77
Description: Effect of excess O_2 on gaseous emissions

Time of Reading	9:15	9:55	10:08		
Stm Integrator (x 3000 lb/hr)	281824	281869	281885		
Stm Flow (% of $3x10^5$ lb/hr)	70	70			
FW Flow (% of $4x10^5$ lb/hr)	54	55			
Air Flow (% relative)	65	62			
Stm Hdr Press (psig)	300				
Grate Temps No. 1	656	654			
(°F) 2	653	725			
3	710	748			
4	685	714			
5	662	764			
6	683	751			
Blr Out Gas Temp (°F)	617	621			
AH Out Gas Temp (°F)	456	458			
Econ Out Gas Temp (°F)	350	350			
Furnace Air Temp (°F)	341	347			
Feedwater Temp (°F)	268	267			
Front OF Air, Top/Bottom (in H_2O)					
Rear OF Air, Top/Bottom (in H_2O)					
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO			
Blr Master Control (0-100%)	51	54			
Stoker Speed Control (0-100%)	50	52			
Air Flow Control (0-100%)	52	49			
Fur Draft Control (0-100%)	28	26			
Feedwater Control (0-100%)	52	53			
Stack Opacity (0-100%)	3.3	9.8			

COMMENTS: Boiler master on automatic, O_2 swinging with load demand, gaseous data taken where ever emissions change directions (i.e. peaks and valleys)

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 8
Date: 20 Aug 77
Description: SO_x at multiclone outlet and at stack

Time of Reading	9:54	11:11	14:53	15:31	
Stm Integrator (x 3000 lb/hr)	283427	283517	283761	283794	
Stm Flow (% of $3x10^5$ lb/hr)	72	71	58	54	
FW Flow (% of $4x10^5$ lb/hr)	55	55	44	43	
Air Flow (% relative)	69.5	70	62	50	
Stm Hdr Press (psig)				300	
Grate Temps No. 1	545	642	703	716	
(°F) 2	482	570	762	824	
3	578	555	788	833	
4	526	586	654	625	
5	648	693	608	640	
6	721	788	694	666	
Blr Out Gas Temp (°F)	623	629	601	579	
AH Out Gas Temp (°F)	460	465	447	431	
Econ Out Gas Temp (°F)	350	355	350	338	
Furnace Air Temp (°F)	342	347	346	344	
Feedwater Temp (°F)	269	270	272	268	
Front OF Air, Top/Bottom (in H_2O)			3.8/6.0		
Rear OF Air, Top/Bottom (in H_2O)			—/10.9		
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	
Blr Master Control (0-100%)	68	67	49	55	
Stoker Speed Control (0-100%)	67	66	50	55	
Air Flow Control (0-100%)	58	58	45	42	
Fur Draft Control (0-100%)	30	31	21	18	
Feedwater Control (0-100%)	52	50	45	46	
Stack Opacity (0-100%)	3.2	3.0	2.8	2.8	

COMMENTS: Load unexpectedly dropped at 14:30 due to problems with the plants process equipment. First two readings multiclone out, second two readings stack test

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 9
Date: 23 Aug 77
Description: SOx, multiclone outlet

Time of Reading	15:18	16:49			
Stm Integrator (x 3000 lb/hr)	288629	288721			
Stm Flow (% of $3x10^5$ lb/hr)	68	66			
FW Flow (% of $4x10^5$ lb/hr)	55				
Air Flow (% relative)	67	59			
Stm Hdr Press (psig)	300	305			
Grate Temps No. 1	652	714			
(°F) 2	630	723			
3	675	733			
4	588	634			
5	618	644			
6	635	696			
Blr Out Gas Temp (°F)	610	597			
AH Out Gas Temp (°F)	450	441			
Econ Out Gas Temp (°F)	344	340			
Furnace Air Temp (°F)	342	350			
Feedwater Temp (°F)	265	263			
Front OF Air, Top/Bottom (in H_2O)					
Rear OF Air, Top/Bottom (in H_2O)					
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	No	No			
Blr Master Control (0-100%)	56				
Stoker Speed Control (0-100%)	56				
Air Flow Control (0-100%)	53				
Fur Draft Control (0-100%)	26				
Feedwater Control (0-100%)	50				
Stack Opacity (0-100%)	3.0	2.9			

COMMENTS: Large load variations during test. This was also supposed to be a Fly ash resistivity test but the WAHLCO resistivity device Failed to work properly

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 10
Date: 24 Aug 77
Description: Particulates at multiclone outlet

Time of Reading	10:06	11:14	12:01		
Stm Integrator (x 3000 lb/hr)	289248	289289	289318		
Stm Flow (% of $3x10^5$ lb/hr)	41	36			
FW Flow (% of $4x10^5$ lb/hr)	34	29			
Air Flow (% relative)	45	45			
Stm Hdr Press (psig)	300	300			
Grate Temps No. 1	503	456			
(°F) 2	459	467			
3	459	495			
4	652	596			
5	862	671			
6	790	702			
Blr Out Gas Temp (°F)	564	551			
AH Out Gas Temp (°F)	413	405			
Econ Out Gas Temp (°F)	325	325			
Furnace Air Temp (°F)	333	325			
Feedwater Temp (°F)	267	271			
Front OF Air, Top/Bottom (in H_2O)	3.3/5.3				
Rear OF Air, Top/Bottom (in H_2O)	—/9.5				
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	No				
Blr Master Control (0-100%)	46	38			
Stoker Speed Control (0-100%)	45	37			
Air Flow Control (0-100%)	37	38			
Fur Draft Control (0-100%)	28	28			
Feedwater Control (0-100%)	46	40			
Stack Opacity (0-100%)	3.1	3.0			

COMMENTS: Clinkers Forming under 5th and 6th Feeders

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 11
Date: 24 Aug 77
Description: Effect of excess O_2 on gaseous emissions

Time of Reading	13:36	13:45	13:57	14:04	14:14
Stm Integrator (x 3000 lb/hr)	289382	289388	289396	289401	289408 *
Stm Flow (% of $3x10^5$ lb/hr)	42	43.5	43.5	43.5	43.5
FW Flow (% of $4x10^5$ lb/hr)	34	35	35	35	35
Air Flow (% relative)	41	45	49.5	54	54
Stm Hdr Press (psig)	300	300	300	300	300
Grate Temps No. 1	496	461	446	434	443
(°F) 2	544	547	525	490	466
3	548	562	569	539	529
4	566	600	604	554	518
5	697	690	676	627	584
6	688	681	672	598	565
Blr Out Gas Temp (°F)	556	562	569	578	583
AH Out Gas Temp (°F)	409	413	416	422	426
Econ Out Gas Temp (°F)	325	325	327	330	332.5
Furnace Air Temp (°F)	336	334	332	330	329
Feedwater Temp (°F)	268	267	268	270	271
Front OF Air, Top/Bottom (in H_2O)					
Rear OF Air, Top/Bottom (in H_2O)					
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	NO
Blr Master Control (0-100%)	48	51	50	53	53
Stoker Speed Control (0-100%)	47	50	50	52	52
Air Flow Control (0-100%)	36	40	42	45	50
Fur Draft Control (0-100%)	23	27	31	33	35
Feedwater Control (0-100%)	45	45	47	46	47
Stack Opacity (0-100%)	3.1	3.2	3.2	3.5	3.6

COMMENTS: * Final integrator reading 289415 @ 14:24

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 12
Date: 24 Aug 77
Description: 50x at multiclone outlet

Time of Reading	15:05	15:54			
Stm Integrator (x 3000 lb/hr)	289444	289481			
Stm Flow (% of $3x10^5$ lb/hr)	44	50			
FW Flow (% of $4x10^5$ lb/hr)	36	41			
Air Flow (% relative)	42.8	49			
Stm Hdr Press (psig)	300	300			
Grate Temps No. 1	617	571			
(°F) 2	527	659			
3	584	650			
4	539	525			
5	510	557			
6	612	604			
Blr Out Gas Temp (°F)	560	580			
AH Out Gas Temp (°F)	413	421			
Econ Out Gas Temp (°F)	326	327			
Furnace Air Temp (°F)	337	335			
Feedwater Temp (°F)	267	265			
Front OF Air, Top/Bottom (in H_2O)	3.2/5.2	3.5/5.5			
Rear OF Air, Top/Bottom (in H_2O)	—/9.3	—/9.7			
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO			
Blr Master Control (0-100%)	51	61			
Stoker Speed Control (0-100%)	50	60			
Air Flow Control (0-100%)	36	42			
Fur Draft Control (0-100%)	24	28			
Feedwater Control (0-100%)	47	52			
Stack Opacity (0-100%)	3.2	3.4			
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 13
Date: 25 Aug 77
Description: Attempted Fly ash resistivity test

Time of Reading	9:42	13:08			
Stm Integrator (x 3000 lb/hr)	290599	290864			
Stm Flow (% of $3x10^5$ lb/hr)	81				
FW Flow (% of $4x10^5$ lb/hr)	65				
Air Flow (% relative)	82				
Stm Hdr Press (psig)	300				
Grate Temps No. 1	622				
(°F) 2	649				
3	716				
4	739				
5	799				
6	770				
Blr Out Gas Temp (°F)	674				
AH Out Gas Temp (°F)	497				
Econ Out Gas Temp (°F)	370				
Furnace Air Temp (°F)	356				
Feedwater Temp (°F)	268				
Front OF Air, Top/Bottom (in H_2O)	4.0/6.5				
Rear OF Air, Top/Bottom (in H_2O)	—/12.0				
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO				
Blr Master Control (0-100%)	55				
Stoker Speed Control (0-100%)	53				
Air Flow Control (0-100%)	66				
Fur Draft Control (0-100%)	40				
Feedwater Control (0-100%)	54				
Stack Opacity (0-100%)	10.0				
COMMENTS: Fly ash resistivity test unsuccessful					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 14
Date: 26 Aug 77
Description: Particulates and Bmk at multiclone outlet

Time of Reading	9:35	10:40	11:34	13:15	17:12
Stm Integrator (x 3000 lb/hr)	292408	292488	292555	292673	292945
Stm Flow (% of $3x10^5$ lb/hr)	77	77	78	72	73
FW Flow (% of $4x10^5$ lb/hr)	57	56	58	53	53
Air Flow (% relative)	77	77	77	73	71
Stm Hdr Press (psig)	300	300	300	300	300
Grate Temps No. 1	464	416	378	435	426
(°F) 2	400	403	401	401	487
3	427	420	397	409	448
4	425	408	397	447	434
5	479	493	538	546	548
6	524	604	591	591	610
Blr Out Gas Temp (°F)	648	642	645	640	627
AH Out Gas Temp (°F)	475	471	474	470	463
Econ Out Gas Temp (°F)	363	362	361	360	350
Furnace Air Temp (°F)	346	343	344	344	345
Feedwater Temp (°F)	268	267	266	270	265
Front OF Air, Top/Bottom (in H_2O)	4.2/6.7	4.1/6.6	4.2/6.6	4.0/6.3	4.0/6.0
Rear OF Air, Top/Bottom (in H_2O)	—/11.6	—/11.6	—/11.6	—/11.2	—/12.0
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	NO
Blr Master Control (0-100%)	55	56	60	57	65
Stoker Speed Control (0-100%)	54	56	60	56	63
Air Flow Control (0-100%)	65	65	65	61	55
Fur Draft Control (0-100%)	38	38	38	37	28
Feedwater Control (0-100%)	40	50	51	49	48
Stack Opacity (0-100%)	4.0	3.4	3.3	3.1	3.0

COMMENTS: Load dropped at 11:45 due to turbine breakdown in process section of plant.

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 15
Date: 27 Aug 77
Description: Particulates at multiclone outlet

Time of Reading	11:28	12:05	13:00	13:38	
Stm Integrator (x 3000 lb/hr)	294281	294325	294393	294440	
Stm Flow (% of $3x10^5$ lb/hr)	71	74	78	77	
FW Flow (% of $4x10^5$ lb/hr)	56	59	61	60	
Air Flow (% relative)	74	74	74	74	
Stm Hdr Press (psig)	300				
Grate Temps No. 1	532		469	474	
(°F) 2	542		442	476	
3	456		493	467	
4	485		447	436	
5	612		493	486	
6	669		667	708	
Blr Out Gas Temp (°F)	636		642	642	
AH Out Gas Temp (°F)	472		475	475	
Econ Out Gas Temp (°F)	361		361	361	
Furnace Air Temp (°F)	347		351	352	
Feedwater Temp (°F)	269		267	266	
Front OF Air, Top/Bottom (in H_2O)					
Rear OF Air, Top/Bottom (in H_2O)					
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	No	No	No	No	
Blr Master Control (0-100%)	54		57	59	
Stoker Speed Control (0-100%)	52		56	58	
Air Flow Control (0-100%)	61		60	60	
Fur Draft Control (0-100%)	35		35	35	
Feedwater Control (0-100%)	50		52	52	
Stack Opacity (0-100%)	3.0		3.0	3.2	
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 16
Date: 30 Aug 77
Description: Particulates at multiclone outlet and at ESP outlet

Time of Reading	11:54	13:39	14:51	15:38	
Stm Integrator (x 3000 lb/hr)	299445	299547	299619	299666	
Stm Flow (% of $3x10^5$ lb/hr)	60	60	62	61	
FW Flow (% of $4x10^5$ lb/hr)	47	48	49	48	
Air Flow (% relative)	64	64	64	64	
Stm Hdr Press (psig)					
Grate Temps No. 1	493	460	435	475	
(°F) 2	653	467	438	451	
3	676	442	422	449	
4	574	489	414	427	
5	535	582	539	530	
6	636	512	582	578	
Blr Out Gas Temp (°F)	613	611	611	611	
AH Out Gas Temp (°F)	453	450	450	450	
Econ Out Gas Temp (°F)	347	349	349	350	
Furnace Air Temp (°F)	347	344	345	345	
Feedwater Temp (°F)	265	268	268	269	
Front OF Air, Top/Bottom (in H_2O)	3.7/5.9	3.7/5.9	3.6/5.9		
Rear OF Air, Top/Bottom (in H_2O)	—/10.2	—/10.2	—/10.2		
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	
Blr Master Control (0-100%)	45	51	48	50	
Stoker Speed Control (0-100%)	44	50	46	48	
Air Flow Control (0-100%)	51	51	51	51	
Fur Draft Control (0-100%)	27	26	26	26	
Feedwater Control (0-100%)	47	53	45	51	
Stack Opacity (0-100%)	2.5	2.5	2.5	2.6	
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 17
Date: 31 Aug 77
Description: Particulates at ESP outlet and at the stack

Time of Reading	14:57	16:38	18:17	19:00	
Stm Integrator (x 3000 lb/hr)	301134	301229	301309	301345	
Stm Flow (% of $3x10^5$ lb/hr)	67	53	52	51	
FW Flow (% of $4x10^5$ lb/hr)	55	45	41	41	
Air Flow (% relative)	69	52	52	52	
Stm Hdr Press (psig)	300	300	300	300	
Grate Temps No. 1	502	442	400	410	
(°F) 2	608	471	414	416	
3	729	458	473	469	
4	696	512	450	414	
5	592	537	499	434	
6	525	494	462	448	
Blr Out Gas Temp (°F)	624	577	574	563	
AH Out Gas Temp (°F)	460	425	420	416	
Econ Out Gas Temp (°F)		330	330	332	
Furnace Air Temp (°F)	348	336	334	330	
Feedwater Temp (°F)	269	264	266	268	
Front OF Air, Top/Bottom (in H_2O)	3.8/6.0	3.5/5.5	3.5/5.5		
Rear OF Air, Top/Bottom (in H_2O)	—/11.5	—/10.8	—/10.9		
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	No	No	No	No	
Blr Master Control (0-100%)	43	38	27	23	
Stoker Speed Control (0-100%)	41	35	22	20	
Air Flow Control (0-100%)	53	40	40	40	
Fur Draft Control (0-100%)	27	18	17	17	
Feedwater Control (0-100%)	46	42	41	38	
Stack Opacity (0-100%)	1.0	1.0	1.0		
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 18
Date: 11 Sep 77
Description: SO_x at multiclone outlet and at stack

Time of Reading	11:22	12:58	16:10	17:52	
Stm Integrator (x 3000 lb/hr)	319528	319602	319749	319828	
Stm Flow (% of $3x10^5$ lb/hr)	48	48	48	48	
FW Flow (% of $4x10^5$ lb/hr)	41	40	40	42	
Air Flow (% relative)	49.5	49.5	49.5	49.5	
Stm Hdr Press (psig)	300	300	300	300	
Grate Temps No. 1	452	400	464	452	
(°F) 2	453	419	440	429	
3	450	430	397	427	
4	509	475	397	403	
5	584	542	456	431	
6	582	559	466	432	
Blr Out Gas Temp (°F)	562	564	564	566	
AH Out Gas Temp (°F)	416	417	418	419	
Econ Out Gas Temp (°F)	330	330	332	332	
Furnace Air Temp (°F)	332	332	333	334	
Feedwater Temp (°F)	261	261	261	262	
Front OF Air, Top/Bottom (in H_2O)	5.1/5.9		5.0/6.8		
Rear OF Air, Top/Bottom (in H_2O)	—/9.4		—/9.2		
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	
Blr Master Control (0-100%)	37	37	37	37	
Stoker Speed Control (0-100%)	36	36	36	36	
Air Flow Control (0-100%)	40	40	40	40	
Fur Draft Control (0-100%)	19	19	18	18	
Feedwater Control (0-100%)	51	41	50	55	
Stack Opacity (0-100%)	3.3	2.7	3.1	3.2	

COMMENTS: Unit is base loaded today and very steady

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 19
Date: 12 Sep 77
Description: Brink cascade impactor at multiclone outlet

Time of Reading	13:53	14:49			
Stm Integrator (x 3000 lb/hr)	320723	320764			
Stm Flow (% of $3x10^5$ lb/hr)	47	47			
FW Flow (% of $4x10^5$ lb/hr)	38				
Air Flow (% relative)	43.5	43.5			
Stm Hdr Press (psig)	300	300			
Grate Temps No. 1	453	486			
(°F) 2	417	410			
3	459	451			
4	415	442			
5	476	546			
6	557	562			
Blr Out Gas Temp (°F)	552	556			
AH Out Gas Temp (°F)	411	414			
Econ Out Gas Temp (°F)	326	327			
Furnace Air Temp (°F)	339	340			
Feedwater Temp (°F)	261	262			
Front OF Air, Top/Bottom (in H_2O)	4.9/6.8				
Rear OF Air, Top/Bottom (in H_2O)	—/9.0				
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	NO	NO			
Blr Master Control (0-100%)	32	32			
Stoker Speed Control (0-100%)	31	31			
Air Flow Control (0-100%)	38	38			
Fur Draft Control (0-100%)	15	15			
Feedwater Control (0-100%)	45	48			
Stack Opacity (0-100%)	3.5	3.5			
COMMENTS:					

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 20
Date: 14 Sep 77
Description: SO_x at multiclone outlet, Brink at ESP outlet

Time of Reading	9:55	12:15	14:25		
Stm Integrator (x 3000 lb/hr)	322775	322875	322966		
Stm Flow (% of $3x10^5$ lb/hr)	45	40	45		
FW Flow (% of $4x10^5$ lb/hr)	33	31			
Air Flow (% relative)	33	32	32		
Stm Hdr Press (psig)	300	300	300		
Grate Temps No. 1	514	479	607		
(°F) 2	443	459	526		
3	478	472	498		
4	511	422	486		
5	632	522	618		
6	638	564	609		
Blr Out Gas Temp (°F)	530	527	537		
AH Out Gas Temp (°F)	389	385	394		
Econ Out Gas Temp (°F)	317	312	319		
Furnace Air Temp (°F)	331	328	336		
Feedwater Temp (°F)	258	259	268		
Front OF Air, Top/Bottom (in H_2O)	5.3/5.0	5.5/5.0	5.2/5.0		
Rear OF Air, Top/Bottom (in H_2O)	—/2.0	—/3.0	—/2.0		
Reinj Air, Mech/AH/Blr (in H_2O)					
Mech Ash Reinj, Yes or No	No	No	No		
Blr Master Control (0-100%)	24	30	33		
Stoker Speed Control (0-100%)	23	30	32		
Air Flow Control (0-100%)	28	26	30		
Fur Draft Control (0-100%)	9	9	9		
Feedwater Control (0-100%)	39	38			
Stack Opacity (0-100%)	3.0	3.0	3.0		
COMMENTS:					

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 21
Date: 23 Sep 77
Description: Particulates at boiler outlet without Fly ash reinjection

Time of Reading	10:30	11:37	12:42		
Stm Integrator (x 3000 lb/hr)	334470	334561	334650		
Stm Flow (% of $3x10^5$ lb/hr)	82	84	82		
FW Flow (% of $4x10^5$ lb/hr)	61	62	61		
Air Flow (% relative)	92	92	92		
Stm Hdr Press (psig)					
Grate Temps No. 1	563	511	417		
(°F) 2	565	551	505		
3	584	567	521		
4	490	450	407		
5	573	617	552		
6	658	672	662		
Blr Out Gas Temp (°F)	708	706	696		
AH Out Gas Temp (°F)	505	506	503		
Econ Out Gas Temp (°F)	385	387	387		
Furnace Air Temp (°F)	353	354	351		
Feedwater Temp (°F)	274	274	276		
Front OF Air, Top/Bottom (in H_2O)		5.0/5.0	5.0/5.0		
Rear OF Air, Top/Bottom (in H_2O)		2.7/5.0	2.7/5.0		
Reinj Air, Mech/AH/Blr (in H_2O)		5.0/-/-	5.0/-/-		
Mech Ash Reinj, Yes or No	No	No	No		
Blr Master Control (0-100%)	63	63	60		
Stoker Speed Control (0-100%)	61	61	59		
Air Flow Control (0-100%)	80	80	80		
Fur Draft Control (0-100%)	50	50	50		
Feedwater Control (0-100%)	58	59	60		
Stack Opacity (0-100%)	7.9	25	7.6		

COMMENTS: Grate drive shut off during entire test to allow ash bed to build up. Ash bed was one inch thick.

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 22
Date: 23 Sep 77
Description: Particulates at boiler outlet with Fly ash reinjection

Time of Reading	16:00	17:07			
Stm Integrator (x 3000 lb/hr)	334905	334998			
Stm Flow (% of $3x10^5$ lb/hr)	85	86			
FW Flow (% of $4x10^5$ lb/hr)	62	64			
Air Flow (% relative)	93.5	94			
Stm Hdr Press (psig)					
Grate Temps No. 1	328	323			
(°F) 2	378	354			
3	421	399			
4	360	367			
5	466	449			
6	450	378			
Blr Out Gas Temp (°F)	713	710			
AH Out Gas Temp (°F)	507	508			
Econ Out Gas Temp (°F)	391	392			
Furnace Air Temp (°F)	355	357			
Feedwater Temp (°F)	273	274			
Front OF Air, Top/Bottom (in H_2O)	5.0/5.0	5.0/5.0			
Rear OF Air, Top/Bottom (in H_2O)	5.0/3.2	5.0/3.0			
Reinj Air, Mech/AH/Blr (in H_2O)	9.8/-/-	10.0/-/-			
Mech Ash Reinj, Yes or No	YES	YES			
Blr Master Control (0-100%)	68	68			
Stoker Speed Control (0-100%)	67	67			
Air Flow Control (0-100%)	82	82			
Fur Draft Control (0-100%)	50	50			
Feedwater Control (0-100%)	63	64			
Stack Opacity (0-100%)	25	50			

COMMENTS: Grate drive shut down during entire test to allow ash bed to build up.
Bottom ash is forming a crust with holes corresponding to the holes on the grate.

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 23
Date: 24 Sep 77
Description: Particulates at boiler outlet with Fly ash reinjection

Time of Reading		12:18	12:58	13:51		
Stm Integrator (x 3000 lb/hr)		336344	336383	336435		
Stm Flow (% of $3x10^5$ lb/hr)		61	61	61		
FW Flow (% of $4x10^5$ lb/hr)		47	47	47		
Air Flow (% relative)		59.5	60	59		
Stm Hdr Press (psig)		300				
Grate Temps No. 1		697	717	692		
(°F)	2	788	785	696		
	3	793	811	745		
	4	814	798	684		
	5	967	863	718		
	6	1003	942	837		
Blr Out Gas Temp (°F)		611	611	610		
AH Out Gas Temp (°F)		447	442	446		
Econ Out Gas Temp (°F)		350	350	350		
Furnace Air Temp (°F)		349	345	348		
Feedwater Temp (°F)		265	265	265		
Front OF Air, Top/Bottom (in H_2O)		5.0/5.0	5.0/6.5			
Rear OF Air, Top/Bottom (in H_2O)		5.0/2.7	5.0/2.7			
Reinj Air, Mech/AH/Blr (in H_2O)		9.0/-/-	9.0/-/-			
Mech Ash Reinj, Yes or No		YES	YES	YES		
Blr Master Control (0-100%)		44	44	44		
Stoker Speed Control (0-100%)		42	42	43		
Air Flow Control (0-100%)		45	45	45		
Fur Draft Control (0-100%)		25	25	25		
Feedwater Control (0-100%)		50	50	47		
Stack Opacity (0-100%)		3.0	2.8	2.8		

COMMENTS: Bottom ash is crusty and thin. There were no clinker problems. Note high grate temperatures.

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 24
Date: 24 Sep 77
Description: Particulates at boiler outlet without Fly ash reinjection

Time of Reading	15:32	16:57			
Stm Integrator (x 3000 lb/hr)	336529	336612			
Stm Flow (% of $3x10^5$ lb/hr)	61	60			
FW Flow (% of $4x10^5$ lb/hr)	47	46			
Air Flow (% relative)	59	61			
Stm Hdr Press (psig)					
Grate Temps No. 1	545	657			
(°F) 2	589	636			
3	552	690			
4	511	677			
5	443	637			
6	743	714			
Blr Out Gas Temp (°F)	607	606			
AH Out Gas Temp (°F)	446	443			
Econ Out Gas Temp (°F)	350	350			
Furnace Air Temp (°F)	348	341			
Feedwater Temp (°F)	262	268			
Front OF Air, Top/Bottom (in H_2O)	6.1/5.0	6.2/5.1			
Rear OF Air, Top/Bottom (in H_2O)	5.0/2.7	5.0/2.7			
Reinj Air, Mech/AH/Blr (in H_2O)	6.0/-/-	6.0/-/-			
Mech Ash Reinj, Yes or No	NO	NO			
Blr Master Control (0-100%)	51	51			
Stoker Speed Control (0-100%)	50	50			
Air Flow Control (0-100%)	47	47			
Fur Draft Control (0-100%)	26	26			
Feedwater Control (0-100%)	51	50			
Stack Opacity (0-100%)	3.0	3.0			
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 25
Date: 5 Oct 77
Description: Gaseous only, vary overfire air

Time of Reading	10:17	11:15	11:58	13:45	
Stm Integrator (x 3000 lb/hr)	341858	341930	341979	342115	
Stm Flow (% of $3x10^5$ lb/hr)	80	74	74		
FW Flow (% of $4x10^5$ lb/hr)	58	54			
Air Flow (% relative)	89	82			
Stm Hdr Press (psig)	300	300			
Grate Temps No. 1	514	521			
(°F) 2	606	623			
3	621	645			
4	519	574			
5	702	692			
6	664	666			
Blr Out Gas Temp (°F)	703	681			
AH Out Gas Temp (°F)	502	491			
Econ Out Gas Temp (°F)	387	383			
Furnace Air Temp (°F)	354	356			
Feedwater Temp (°F)	273	272			
Front OF Air, Top/Bottom (in H_2O)	5.4/5.2	9.0/9.0			
Rear OF Air, Top/Bottom (in H_2O)	4.0/2.3	9.0/9.0			
Reinj Air, Mech/AH/Blr (in H_2O)	6.0/6.7/-	6.0/6.7/-			
Mech Ash Reinj, Yes or No	NO	NO			
Blr Master Control (0-100%)	51	50			
Stoker Speed Control (0-100%)	49	47			
Air Flow Control (0-100%)	65	58			
Fur Draft Control (0-100%)	46	43			
Feedwater Control (0-100%)	45	45			
Stack Opacity (0-100%)	4.5	3.6			
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 26 A
Date: 6 Oct 77
Description: Particulates Boiler Outlet.

Time of Reading	9:52	10:49	12:02		
Stm Integrator (x 3000 lb/hr)	343683	343750	343835		
Stm Flow (% of $3x10^5$ lb/hr)	72	72	72		
FW Flow (% of $4x10^5$ lb/hr)	53	52.5	53		
Air Flow (% relative)	79	79	78		
Stm Hdr Press (psig)	300	300	300		
Grate Temps No. 1	393	471	478		
(°F) 2	395	387	448		
3	443	417	484		
4	437	485	501		
5	501	498	591		
6	633	608	645		
Blr Out Gas Temp (°F)	658	664	658		
AH Out Gas Temp (°F)	482	482	481		
Econ Out Gas Temp (°F)	379	378	377		
Furnace Air Temp (°F)	349	349	350		
Feedwater Temp (°F)	272	271	270		
Front OF Air, Top/Bottom (in H_2O)	6.0/6.0	6.0/6.0	6.0/6.0		
Rear OF Air, Top/Bottom (in H_2O)	6.0/6.0	6.0/6.0	6.0/6.0		
Reinj Air, Mech/AH/Blr (in H_2O)	6.0/6.5/8.8	6.0/6.5/8.8	6.0/6.5/8.7		
Mech Ash Reinj, Yes or No	NO	NO	NO		
Blr Master Control (0-100%)	44	48	50		
Stoker Speed Control (0-100%)	41	46	48		
Air Flow Control (0-100%)	55	55	55		
Fur Draft Control (0-100%)	41	41	40		
Feedwater Control (0-100%)	41	42	43		
Stack Opacity (0-100%)	3.8	4.4	4.3		
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 26 B
Date: 6 Oct 77
Description: Particulates Multiclone Outlet

Time of Reading	15:12	16:26	16:58		
Stm Integrator (x 3000 lb/hr)	344058	344148	344188		
Stm Flow (% of 3x10^5 lb/hr)	74	76.5	79		
FW Flow (% of 4x10^5 lb/hr)	54.5	55.5	57		
Air Flow (% relative)	80	80	80		
Stm Hdr Press (psig)	300	300	300		
Grate Temps No. 1	433	460	463		
(°F) 2	451	478	450		
3	480	487	552		
4	595	570	547		
5	592	647	627		
6	608	614	616		
Blr Out Gas Temp (°F)	663	663	663		
AH Out Gas Temp (°F)	486	486	485		
Econ Out Gas Temp (°F)	379	378	378		
Furnace Air Temp (°F)	353	354	353		
Feedwater Temp (°F)	270	268	267		
Front OF Air, Top/Bottom (in H_2O)	6.0/6.0	6.0/6.0			
Rear OF Air, Top/Bottom (in H_2O)	6.0/6.0	6.0/6.0			
Reinj Air, Mech/AH/Blr (in H_2O)	6.0/6.5/8.7	6.0/6.5/8.7			
Mech Ash Reinj, Yes or No	NO	NO			
Blr Master Control (0-100%)	59	59	63		
Stoker Speed Control (0-100%)	56	56	60		
Air Flow Control (0-100%)	57	57	57		
Fur Draft Control (0-100%)	41	42	42		
Feedwater Control (0-100%)	43	44	46		
Stack Opacity (0-100%)	5.2	4.4	11.0		
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 27
Date: 8 Oct 77
Description: SASS Boiler outlet

Time of Reading		11:07	13:15	14:46		
Stm Integrator (x 3000 lb/hr)		347319	347492	347615		
Stm Flow (% of $3x10^5$ lb/hr)		83	83	83		
FW Flow (% of $4x10^5$ lb/hr)		61	61			
Air Flow (% relative)		92	94	94		
Stm Hdr Press (psig)		300	300	300		
Grate Temps No.	1	499	416	485		
(°F)	2	444	438	447		
	3	487	485	438		
	4	509	503	511		
	5	638	608	485		
	6	638	637	591		
Blr Out Gas Temp (°F)		688	697	693		
AH Out Gas Temp (°F)		497	507	500		
Econ Out Gas Temp (°F)		395	400	400		
Furnace Air Temp (°F)		369	360	358		
Feedwater Temp (°F)		265	266	266		
Front OF Air, Top/Bottom (in H_2O)		6.0/6.0	6.0/6.0			
Rear OF Air, Top/Bottom (in H_2O)		6.0/6.0	6.0/6.0			
Reinj Air, Mech/AH/Blr (in H_2O)		5.0/6.5/8.5	5.0/6.5/8.5			
Mech Ash Reinj, Yes or No		NO	NO			
Blr Master Control (0-100%)		64	64	65		
Stoker Speed Control (0-100%)		61	61	62		
Air Flow Control (0-100%)		62	70	70		
Fur Draft Control (0-100%)		48	53	53		
Feedwater Control (0-100%)		48	47	46		
Stack Opacity (0-100%)		15	7.5	5.0		
COMMENTS:						

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 28
Date: 10 Oct 77
Description: Particulates boiler outlet at minimum overfire air

Time of Reading	11:36	12:20	13:10		
Stm Integrator (x 3000 lb/hr)	351203	351264	351334		
Stm Flow (% of $3x10^5$ lb/hr)	84	85	85		
FW Flow (% of $4x10^5$ lb/hr)	62	63	62		
Air Flow (% relative)	97	98	98		
Stm Hdr Press (psig)	300	300	300		
Grate Temps No. 1	389	387	458		
(°F) 2	412	363	368		
3	389	415	422		
4	441	385	387		
5	387	376	368		
6	458	447	522		
Blr Out Gas Temp (°F)	698	704	709		
AH Out Gas Temp (°F)	505	509	510		
Econ Out Gas Temp (°F)	407	407	408		
Furnace Air Temp (°F)	368	362	365		
Feedwater Temp (°F)	265	265	265		
Front OF Air, Top/Bottom (in H_2O)	4.0/4.0	4.0/4.0	4.0/4.0		
Rear OF Air, Top/Bottom (in H_2O)	4.0/4.0	4.0/4.0	4.0/4.0		
Reinj Air, Mech/AH/Blr (in H_2O)	8.4/7.5/9.0	8.1/7.5/9.0	8.4/7.5/8.5		
Mech Ash Reinj, Yes or No	NO	NO	NO		
Blr Master Control (0-100%)	61	60	63		
Stoker Speed Control (0-100%)	60	57	60		
Air Flow Control (0-100%)	71	69	75		
Fur Draft Control (0-100%)	54	57	57		
Feedwater Control (0-100%)	51	49	48		
Stack Opacity (0-100%)	50	24	8.5		
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 29
Date: 10 Oct 77
Description: Particulates boiler outlet at maximum overFire air

Time of Reading	14:24	15:10	15:46		
Stm Integrator (x 3000 lb/hr)	351437	351500	351553		
Stm Flow (% of $3x10^5$ lb/hr)	85	86	87		
FW Flow (% of $4x10^5$ lb/hr)	62	62	62		
Air Flow (% relative)	97	97	97		
Stm Hdr Press (psig)	300	300	300		
Grate Temps No. 1	451	481	477		
(°F) 2	410	430	462		
3	451	443	441		
4	396	461	468		
5	424	438	478		
6	463	481	557		
Blr Out Gas Temp (°F)	707	709	698		
AH Out Gas Temp (°F)	512	507	502		
Econ Out Gas Temp (°F)	410	410	410		
Furnace Air Temp (°F)	369	360	358		
Feedwater Temp (°F)	266	267	267		
Front OF Air, Top/Bottom (in H_2O)	9.0/9.0	9.0/9.1	8.8/9.0		
Rear OF Air, Top/Bottom (in H_2O)	9.0/9.0	9.5/9.0	9.3/9.0		
Reinj Air, Mech/AH/Blr (in H_2O)	7.5/7.0/7.5	7.6/7.2/7.5	6.0/7.0/7.5		
Mech Ash Reinj, Yes or No	NO	NO	NO		
Blr Master Control (0-100%)	62	67	71		
Stoker Speed Control (0-100%)	60	64	67		
Air Flow Control (0-100%)	75	75	74		
Fur Draft Control (0-100%)	56	57	59		
Feedwater Control (0-100%)	49	49	51		
Stack Opacity (0-100%)	12	4.5	4.5		
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 30
Date: 13 Oct 77
Description: Brink cascade impactor at boiler outlet

Time of Reading	13.10	13:33	14:33		
Stm Integrator (x 3000 lb/hr)	357013	357043	357123		
Stm Flow (% of $3x10^5$ lb/hr)	81	82	82		
FW Flow (% of $4x10^5$ lb/hr)	60	59	59		
Air Flow (% relative)	90	89	90		
Stm Hdr Press (psig)	300	300	300		
Grate Temps No. 1	566	580	503		
(°F) 2	575	506	568		
3	572	598	611		
4	560	517	586		
5	594	572	648		
6	661	675	694		
Blr Out Gas Temp (°F)	683	682	677		
AH Out Gas Temp (°F)	500	501	504		
Econ Out Gas Temp (°F)	402	402	402		
Furnace Air Temp (°F)	361	361	362		
Feedwater Temp (°F)	264	264	263		
Front OF Air, Top/Bottom (in H_2O)	8.7/8.6	8.7/8.4	8.7/8.5		
Rear OF Air, Top/Bottom (in H_2O)	9.1/8.8	9.1/8.9	9.1/9.0		
Reinj Air, Mech/AH/Blr (in H_2O)	7.3/7.0/8.0	7.2/7.1/8.2	7.4/7.0/8.0		
Mech Ash Reinj, Yes or No	NO	NO	NO		
Blr Master Control (0-100%)	58	59	58		
Stoker Speed Control (0-100%)	56	56	55		
Air Flow Control (0-100%)	65	65	65		
Fur Draft Control (0-100%)	59	49	49		
Feedwater Control (0-100%)	47	46	47		
Stack Opacity (0-100%)	3	6	3.5		
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 31
Date: 14 Oct 77
Description: Gaseous only, vary overfire air

Time of Reading	11:23	11:44	11:53	11:58	13:26
Stm Integrator (x 3000 lb/hr)	358669	358688	358646	358700	358781
Stm Flow (% of $3x10^5$ lb/hr)	54	54	54	54	58
FW Flow (% of $4x10^5$ lb/hr)	41	40	39	39	43
Air Flow (% relative)	38	38	38	38	40
Stm Hdr Press (psig)	300				300
Grate Temps No. 1	613				520
(°F) 2	577				585
3	753				696
4	737				717
5	641				472
6	709				647
Blr Out Gas Temp (°F)	559	560	559	558	584
AH Out Gas Temp (°F)	411	411	412	412	427
Econ Out Gas Temp (°F)	340	335	335	335	343
Furnace Air Temp (°F)	344	345	345	346	340
Feedwater Temp (°F)	260	260	259	259	258
Front OF Air, Top/Bottom (in H_2O)	4.9/5.2	5.2/1.9	4.3/9.8	4.8/5.1	4.9/5.1
Rear OF Air, Top/Bottom (in H_2O)	5.0/5.0	6.0/5.5	4.8/5.0	5.0/5.0	5.5/5.1
Reinj Air, Mech/AH/Blr (in H_2O)	7.0/8.0/9.0	7.0/7.0/9.0	7.0/7.0/9.0	6.5/7.5/9.0	7.0/6.5/9.0
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	NO
Blr Master Control (0-100%)	68	28	29	40	35
Stoker Speed Control (0-100%)	20	26	26	38	33
Air Flow Control (0-100%)	29	29	29	29	37
Fur Draft Control (0-100%)	11				18
Feedwater Control (0-100%)	31				34
Stack Opacity (0-100%)	3.0	3.0	2.5	14	2.5
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 31
Date:
Description: Page 2 of 2

Time of Reading	13:35	13:43	13:52	14:09	14:21
Stm Integrator (x 3000 lb/hr)	358789	358797	358805	358820	358832
Stm Flow (% of $3x10^5$ lb/hr)	58	58	58	58	58
FW Flow (% of $4x10^5$ lb/hr)	43	43	43	43	42
Air Flow (% relative)	48	48	49	49	49
Stm Hdr Press (psig)					
Grate Temps No. 1					
(°F) 2					
3					
4					
5					
6					
Blr Out Gas Temp (°F)	583	582	582	587	587
AH Out Gas Temp (°F)	426	426	426	428	426
Econ Out Gas Temp (°F)	343	343	344	344	349
Furnace Air Temp (°F)	340	340	340	341	341
Feedwater Temp (°F)	258	259	257	258	259
Front OF Air, Top/Bottom (in H_2O)	2.0/5.2	10.0/5.0	5.0/5.2	5.2/5.3	4.9/5.0
Rear OF Air, Top/Bottom (in H_2O)	5.5/5.2	5.5/5.0	5.0/5.2	5.5/2.0	5.0/10.0
Reinj Air, Mech/AH/Blr (in H_2O)	7.2/7.0/9.0	6.5/7.0/9.0	6.2/6.5/9.5	7.0/7.0/9.0	7.2/7.0/7.0
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	NO
Blr Master Control (0-100%)	38	38	40	38	55
Stoker Speed Control (0-100%)	35	37	37	36	54
Air Flow Control (0-100%)	37	36	37	37	37
Fur Draft Control (0-100%)					
Feedwater Control (0-100%)					
Stack Opacity (0-100%)	2.5	2.5	3.0	2.7	10
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 32
Date: 15 Oct 77
Description: SASS Boiler outlet

Time of Reading	12:46	13:23	14:16	15:19	16:13
Stm Integrator (x 3000 lb/hr)	360621	360674	360748	360834	360906
Stm Flow (% of $3x10^5$ lb/hr)	88	87.5	84.5	82.0	82.0
FW Flow (% of $4x10^5$ lb/hr)	64	64	61	60	59
Air Flow (% relative)	100 +	100 +	88	88	88
Stm Hdr Press (psig)	300		303	302	301
Grate Temps No. 1	448	557	576	658	667
(°F) 2	470	565	650	707	673
3	528	603	693	733	693
4	493	536	628	652	652
5	545	593	650	711	690
6	595	588	597	653	634
Blr Out Gas Temp (°F)	717	718	686	692	683
AH Out Gas Temp (°F)	514	521	499	506	496
Econ Out Gas Temp (°F)	414	416	405	404	401
Furnace Air Temp (°F)	356	362	363	366	360
Feedwater Temp (°F)	264	265	264	265	263
Front OF Air, Top/Bottom (in H_2O)	12.0/10.5	12.0/10.0	11.5/10.0		
Rear OF Air, Top/Bottom (in H_2O)	13.0/11.0	13.0/10.7	12.5/10.5		
Reinj Air, Mech/AH/Blr (in H_2O)	5.0/6.5/7.5	5.0/6.5/7.5		5.0/6.5/7.5	
Mech Ash Reinj, Yes or No	No	No	No	No	
Blr Master Control (0-100%)	75	68	70	64	61
Stoker Speed Control (0-100%)	72	65	66	61	59
Air Flow Control (0-100%)	80	80	62	62	62
Fur Draft Control (0-100%)	65	67	50	50	48
Feedwater Control (0-100%)	50	50	49	47	46
Stack Opacity (0-100%)	30-60	10-30	4.2	3.0	3.0
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 33
Date: 16 Oct 77
Description: Collected ash sample For sizing tests

Time of Reading	10:58	11:55	12:33		
Stm Integrator (x 3000 lb/hr)	362407	362486	362532		
Stm Flow (% of $3x10^5$ lb/hr)	86	84	62		
FW Flow (% of $4x10^5$ lb/hr)	63	62	46		
Air Flow (% relative)	95	96	98		
Stm Hdr Press (psig)	302	302	302		
Grate Temps No. 1	425	417	448		
(°F) 2	414	409	436		
3	382	454	411		
4	437	498	449		
5	546	632	591		
6	610	629	549		
Blr Out Gas Temp (°F)	695	691	671		
AH Out Gas Temp (°F)	507	507	484		
Econ Out Gas Temp (°F)	407	408	407		
Furnace Air Temp (°F)	361	362	351		
Feedwater Temp (°F)	264	264	274		
Front OF Air, Top/Bottom (in H_2O)	10.0/10.0	9.9/9.8	9.8/9.8		
Rear OF Air, Top/Bottom (in H_2O)	10.5/10.0	10.2/9.8	10.2/9.5		
Reinj Air, Mech/AH/Blr (in H_2O)	4.5/6.5/7.5	5.0/6.5/7.0	5.0/6.5/7.2		
Mech Ash Reinj, Yes or No	NO	NO	NO		
Blr Master Control (0-100%)	62	62	38		
Stoker Speed Control (0-100%)	59	59	35		
Air Flow Control (0-100%)	62	72	62		
Fur Draft Control (0-100%)	54	54	54		
Feedwater Control (0-100%)	49	49	38		
Stack Opacity (0-100%)	4.0	4.0	3.0		
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 34
Date: 29 Oct 77
Description: SASS, SOx, Particulates at Blr out and ESP out, high OF air

Time of Reading	1103	1140	1210	1255	1323
Stm Integrator (x 3000 lb/hr)	387457	387502		387601	387635
Stm Flow (% of $3x10^5$ lb/hr)	78	80	78	78	77
FW Flow (% of $4x10^5$ lb/hr)	58	60	58	58	58
Air Flow (% relative)	62	68	66	70	73
Stm Hdr Press (psig)	303	303	303	303	303
Grate Temps No. 1	369	419	491	429	454
(°F) 2	413	464	604	516	554
3	431	497	503	511	500
4	448	520	515	506	485
5	466	522	482	520	544
6	550	585	541	586	580
Blr Out Gas Temp (°F)	621	632	631	635	637
AH Out Gas Temp (°F)	459	464	465	471	472
Econ Out Gas Temp (°F)	361	375	365	370	370
Furnace Air Temp (°F)	350	351	352	351	350
Feedwater Temp (°F)	262	262	261	262	263
Front OF Air, Top/Bottom (in H_2O)	10.7/10.5	10.8/10.5	10.7/10.5	10.6/10.4	10.5/10.5
Rear OF Air, Top/Bottom (in H_2O)	10.5/10.7	10.3/10.7	10.3/10.6	10.4/10.6	10.3/10.7
Reinj Air, Mech/AH/Blr (in H_2O)	6.5/6.8/7.0	6.0/6.3/8.0	5.5/6.0/7.5	5.2/6.0/7.5	5.2/6.0/7.5
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	NO
Blr Master Control (0-100%)	68	68	68	68	68
Stoker Speed Control (0-100%)	66	66	66	66	66
Air Flow Control (0-100%)	45	50	50	51	52
Fur Draft Control (0-100%)	26	30	29	31	32
Feedwater Control (0-100%)	49	50	50	52	50
Stack Opacity (0-100%)					

COMMENTS: Precipitator Fields A, B + D not operating. Increased air flow @ 12:55 because grate started to clinker up.

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 34
Date:
Description: Page 2 of 3

Time of Reading	1355	1448	1510	1557	1646
Stm Integrator (x 3000 lb/hr)		387716	387766	387832	387893
Stm Flow (% of $3x10^5$ lb/hr)	76	76	82	80	76
FW Flow (% of $4x10^5$ lb/hr)	58	56	62	61	56
Air Flow (% relative)	71	74	77	85	74
Stm Hdr Press (psig)	304	305	304	303	302
Grate Temps No. 1	461	476	497	419	413
(°F) 2	484	601	572	440	406
3	475	510	560	437	422
4	477	517	493	445	438
5	530	492	544	570	547
6	610	605	633	541	548
Blr Out Gas Temp (°F)	634	634	652	668	636
AH Out Gas Temp (°F)	471	471	483	494	468
Econ Out Gas Temp (°F)	370	370	380	385	373
Furnace Air Temp (°F)	349	345	352	352	347
Feedwater Temp (°F)	262	263	264	267	266
Front OF Air, Top/Bottom (in H_2O)	10.5/10.4	10.6/10.4	10.6/10.3	10.5/10.8	10.6/10.3
Rear OF Air, Top/Bottom (in H_2O)	10.3/10.5	10.3/10.4	10.3/10.5	10.5/10.7	10.0/10.5
Reinj Air, Mech/AH/Blr (in H_2O)	5.3/6.0/8.0	5.3/6.0/8.0	5.0/6.0/8.0	5.2/6.5/8.0	5.3/6.0/8.0
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	NO
Blr Master Control (0-100%)	68	70	68	67	66
Stoker Speed Control (0-100%)	67	67	67	65	64
Air Flow Control (0-100%)	52	53	55	63	46
Fur Draft Control (0-100%)	32	33	37	42	29
Feedwater Control (0-100%)	50	51	53	51	51
Stack Opacity (0-100%)					
COMMENTS:					

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KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 34
Date:
Description: Page 3 of 3

Time of Reading	1715				
Stm Integrator (x 3000 lb/hr)	387929				
Stm Flow (% of $3x10^5$ lb/hr)	76				
FW Flow (% of $4x10^5$ lb/hr)	54				
Air Flow (% relative)	72				
Stm Hdr Press (psig)	303				
Grate Temps No. 1	411				
(°F) 2	457				
3	432				
4	481				
5	598				
6	563				
Blr Out Gas Temp (°F)	635				
AH Out Gas Temp (°F)	468				
Econ Out Gas Temp (°F)	370				
Furnace Air Temp (°F)	346				
Feedwater Temp (°F)	266				
Front OF Air, Top/Bottom (in H_2O)	10.6/10.4				
Rear OF Air, Top/Bottom (in H_2O)	10.3/10.5				
Reinj Air, Mech/AH/Blr (in H_2O)	5.3/6.1/8.0				
Mech Ash Reinj, Yes or No	No				
Blr Master Control (0-100%)	67				
Stoker Speed Control (0-100%)	65				
Air Flow Control (0-100%)	51				
Fur Draft Control (0-100%)	32				
Feedwater Control (0-100%)	49				
Stack Opacity (0-100%)					
COMMENTS:					

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KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 35
Date: 30 Oct 77
Description: SASS, SO_x, Particulates at Blr out & Esp out, normal operation

Time of Reading	1240	1300	1338	1400	1445
Stm Integrator (x 3000 lb/hr)	389073			389172	
Stm Flow (% of $3x10^5$ lb/hr)	81	76	78	76	78
FW Flow (% of $4x10^5$ lb/hr)	59	56	55	54	59
Air Flow (% relative)	94	92	91	91	91
Stm Hdr Press (psig)	302	301	301	301	301
Grate Temps No. 1	321	319	344	361	335
(°F) 2	337	334	351	345	354
3	331	329	328	326	328
4	332	329	331	331	331
5	337	333	334	332	338
6	340	340	333	339	350
Blr Out Gas Temp (°F)	681	675	675	672	674
AH Out Gas Temp (°F)	497	492	492	490	493
Econ Out Gas Temp (°F)	392	390	390	387	388
Furnace Air Temp (°F)	347	342	341	340	343
Feedwater Temp (°F)	270	272	272	272	269
Front OF Air, Top/Bottom (in H_2O)	5.8/5.2	5.8/5.3	5.8/5.2	5.8/5.1	5.8/5.2
Rear OF Air, Top/Bottom (in H_2O)	6.0/5.0	6.0/5.1	6.0/5.0	6.0/5.0	6.0/5.1
Reinj Air, Mech/AH/Blr (in H_2O)	8.0/7.0/8.8	8.0/7.0/9.0	8.2/7.0/8.5	7.8/7.0/8.5	8.0/7.0/8.5
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	NO
Blr Master Control (0-100%)	40	40	42	45	46
Stoker Speed Control (0-100%)	40	38	40	43	45
Air Flow Control (0-100%)	72	72	71	72	72
Fur Draft Control (0-100%)	42	43	43	43	43
Feedwater Control (0-100%)	48	47	50	49	51
Stack Opacity (0-100%)					
COMMENTS: Precipitator Fields A, B & D not operating					

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KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 35
Date:
Description: Page 2 of 2

Time of Reading	1530	1557	1628	1657	1729
Stm Integrator (x 3000 lb/hr)		389320	389361	389398	389437
Stm Flow (% of $3x10^5$ lb/hr)	82	81	79	78	77
FW Flow (% of $4x10^5$ lb/hr)	60	59	57	57	57
Air Flow (% relative)	90	90	90	90	91
Stm Hdr Press (psig)	301	301	301	302	301
Grate Temps No. 1	342	351	326	347	358
(°F) 2	369	357	377	383	397
3	334	329	338	343	365
4	332	328	334	333	349
5	341	336	334	345	362
6	366	344	345	350	411
Blr Out Gas Temp (°F)	677	676	671	672	671
AH Out Gas Temp (°F)	490	487	491	491	490
Econ Out Gas Temp (°F)	388	387	387	386	385
Furnace Air Temp (°F)	343	340	343	343	341
Feedwater Temp (°F)	269	269	270	271	270
Front OF Air, Top/Bottom (in H_2O)	5.8/5.2	5.8/5.2	5.8/5.1	5.8/5.2	5.8/5.2
Rear OF Air, Top/Bottom (in H_2O)	6.0/5.2	6.0/5.0	6.0/5.0	6.0/5.0	6.0/5.0
Reinj Air, Mech/AH/Blr (in H_2O)	8.2/7.0/8.5	8.2/7.0/8.5	7.8/7.0/8.5	7.5/7.0/8.5	8.2/7.2/8.5
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	NO
Blr Master Control (0-100%)	46	47	48	50	50
Stoker Speed Control (0-100%)	45	45	46	47	47
Air Flow Control (0-100%)	72	72	72	82	82
Fur Draft Control (0-100%)	43	42	42	43	42
Feedwater Control (0-100%)	52	52	55	45	45
Stack Opacity (0-100%)					
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 36
Date: 1 Nov 77
Description: Particulates at boiler outlet without Fly ash reinjection

Time of Reading	10:05	10:49	13:02		
Stm Integrator (x 3000 lb/hr)	392241	392300	392463		
Stm Flow (% of $3x10^5$ lb/hr)	80	82			
FW Flow (% of $4x10^5$ lb/hr)	55	62			
Air Flow (% relative)	72	74			
Stm Hdr Press (psig)	300	300			
Grate Temps No. 1	349	346			
(°F) 2	344	366			
3	404	380			
4	398	399			
5	494	434			
6	580	476			
Blr Out Gas Temp (°F)	656	660			
AH Out Gas Temp (°F)	484	487			
Econ Out Gas Temp (°F)	370	375			
Furnace Air Temp (°F)	352	352			
Feedwater Temp (°F)	265	265			
Front OF Air, Top/Bottom (in H_2O)	5.0/5.0	5.0/5.0			
Rear OF Air, Top/Bottom (in H_2O)	6.5/2.7	6.5/2.8			
Reinj Air, Mech/AH/Blr (in H_2O)	7.0/7.0/8.5	7.0/7.0/8.8			
Mech Ash Reinj, Yes or No	NO	NO			
Blr Master Control (0-100%)	50	46			
Stoker Speed Control (0-100%)	49	45			
Air Flow Control (0-100%)	57	57			
Fur Draft Control (0-100%)	36	36			
Feedwater Control (0-100%)	50	46			
Stack Opacity (0-100%)	4.0	4.0			

COMMENTS: Control linkage on FD Fan changed Oct 29. Boiler tripped out due to low drum level, estimated 1-2 points sampled during this period.

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 37
Date: 1 Nov 77
Description: Particulates at boiler outlet with fly ash reinjection

Time of Reading	16:07	17:08			
Stm Integrator (x 3000 lb/hr)	392717	392805			
Stm Flow (% of 3×10^5 lb/hr)	86	86			
FW Flow (% of 4×10^5 lb/hr)	63	63			
Air Flow (% relative)	77	77			
Stm Hdr Press (psig)	303				
Grate Temps No. 1	357	359			
(°F) 2	421	364			
3	392	364			
4	419	416			
5	453	467			
6	446	480			
Blr Out Gas Temp (°F)	666	672			
AH Out Gas Temp (°F)	492	494			
Econ Out Gas Temp (°F)	383	385			
Furnace Air Temp (°F)	356	358			
Feedwater Temp (°F)	264	265			
Front OF Air, Top/Bottom (in H_2O)	5.0/5.0	5.0/5.0			
Rear OF Air, Top/Bottom (in H_2O)	6.0/2.8	6.0/2.8			
Reinj Air, Mech/AH/Blr (in H_2O)	8.0/7.0/8.5	8.3/7.0/8.5			
Mech Ash Reinj, Yes or No	YES	YES			
Blr Master Control (0-100%)	45	45			
Stoker Speed Control (0-100%)	45	44			
Air Flow Control (0-100%)	60	60			
Fur Draft Control (0-100%)	38	40			
Feedwater Control (0-100%)	52	55			
Stack Opacity (0-100%)	4.5	3.5			
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 38
Date: 2 Nov 77
Description: Particulates at boiler outlet, maximum O.F. air

Time of Reading	11:07	11:55	12:19	12:36	
Stm Integrator (x 3000 lb/hr)	394052	394100	394122	394139	
Stm Flow (% of $3x10^5$ lb/hr)	62	60	60		
FW Flow (% of $4x10^5$ lb/hr)	46	45	45		
Air Flow (% relative)	48	50	50		
Stm Hdr Press (psig)	300	302	301		
Grate Temps No. 1	359	363	369		
(°F) 2	357	373	398		
3	364	402	378		
4	441	465	484		
5	611	606	616		
6	729	501	554		
Blr Out Gas Temp (°F)	592	586	585		
AH Out Gas Temp (°F)	440	434	432		
Econ Out Gas Temp (°F)	345	344	344		
Furnace Air Temp (°F)	348	342	341		
Feedwater Temp (°F)	262	265	262		
Front OF Air, Top/Bottom (in H_2O)	10.4/10.3				
Rear OF Air, Top/Bottom (in H_2O)	10.5/10.5				
Reinj Air, Mech/AH/Blr (in H_2O)	4.8/5.9/7.5				
Mech Ash Reinj, Yes or No	NO				
Blr Master Control (0-100%)	30	30	30		
Stoker Speed Control (0-100%)	30	29	30		
Air Flow Control (0-100%)	39	40	40		
Fur Draft Control (0-100%)	19	20	20		
Feedwater Control (0-100%)	40	40	38		
Stack Opacity (0-100%)	3.0	2.4	2.4		
COMMENTS:					

15900

KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 39
Date: 2 Nov 77
Description: Particulates at boiler outlet, minimum O.F. air

Time of Reading	15:36	16:12	16:59	17:27	
Stm Integrator (x 3000 lb/hr)	394302	394337	394379	394408	
Stm Flow (% of 3×10^5 lb/hr)	62	60	60	62	
FW Flow (% of 4×10^5 lb/hr)	45	45	43	48	
Air Flow (% relative)	53	52	52	51	
Stm Hdr Press (psig)	300	301	301	301	
Grate Temps No. 1	384	364	363	376	
(°F) 2	401	389	365	370	
3	458	459	391	373	
4	438	434	431	413	
5	441	445	515	523	
6	566	555	567	640	
Blr Out Gas Temp (°F)	587	588	591	599	
AH Out Gas Temp (°F)	434	431	433	436	
Econ Out Gas Temp (°F)	344	340	340	340	
Furnace Air Temp (°F)	341	334	335	337	
Feedwater Temp (°F)	261	260	261	259	
Front OF Air, Top/Bottom (in H_2O)	3.0/3.0	3.0/3.0	3.0/3.0	3.0/3.0	
Rear OF Air, Top/Bottom (in H_2O)	3.0/3.0	3.0/3.0	3.0/3.0	3.0/3.0	
Reinj Air, Mech/AH/Blr (in H_2O)	5.5/6.5/9.0	5.5/6.0/9.0	5.5/6.5/9.0	5.5/6.5/9.0	
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	
Blr Master Control (0-100%)	31	31	31	31	
Stoker Speed Control (0-100%)	31	31	31	31	
Air Flow Control (0-100%)	41	41	40	41	
Fur Draft Control (0-100%)	17	17	17	17	
Feedwater Control (0-100%)	42	41	40	43	
Stack Opacity (0-100%)	3.0	4.0	9.0	9.0	
COMMENTS: Testing stopped between 16:35 and 17:00 when Feeder no. 4 broke down and load dropped.					

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KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 40
Date: 11 Nov 77
Description: SASS at boiler outlet

Time of Reading	10:32	12:05	13:30	14:16	14:56
Stm Integrator (x 3000 lb/hr)	406781	406884	406979	407029	407073
Stm Flow (% of 3x10^5 lb/hr)	69	69	69	69	68
FW Flow (% of 4x10^5 lb/hr)	49	49	48	49	49
Air Flow (% relative)	76	77	78	79	79
Stm Hdr Press (psig)	302	302	302	302	301
Grate Temps No. 1	315	316	335	322	316
(°F) 2	315	320	326	325	324
3	319	321	325	322	322
4	315	320	328	321	322
5	339	343	368	350	351
6	315	324	325	322	319
Blr Out Gas Temp (°F)	633	633	636	636	633
AH Out Gas Temp (°F)	465	467	470	468	468
Econ Out Gas Temp (°F)	370	370	370	372	373
Furnace Air Temp (°F)	333	336	348	347	347
Feedwater Temp (°F)	268	268	271	268	268
Front OF Air, Top/Bottom (in H_2O)	5.6/5.2	5.7/5.3	5.6/5.3	5.6/5.3	5.6/5.4
Rear OF Air, Top/Bottom (in H_2O)	5.9/5.6	5.9/5.2	5.8/5.2	5.8/5.2	5.9/5.5
Reinj Air, Mech/AH/Blr (in H_2O)	5.0/9.0/9.0	5.2/9.0/9.0	5.5/9.0/9.0	5.5/9.0/9.0	5.5/9.0/9.0
Mech Ash Reinj, Yes or No	No	No	No	No	No
Blr Master Control (0-100%)	48	48	48	48	48
Stoker Speed Control (0-100%)	48	48	48	47	47
Air Flow Control (0-100%)	65	65	66	65	65
Fur Draft Control (0-100%)	35	35	36	35	35
Feedwater Control (0-100%)	49	46	46	45	46
Stack Opacity (0-100%)	4.0	3.5	3.5	3.5	3.5

COMMENTS: Sampling started at about 13:30 after a previous False start.

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KVB

CONTROL ROOM DATA
TEST LOCATION A

Test No.: 40
Date:
Description: Page 2 of 2

Time of Reading	15:44	16:23	17:00	17:45	
Stm Integrator (x 3000 lb/hr)	407127	407169	407210	407258	
Stm Flow (% of $3x10^5$ lb/hr)	68	67	67	66	
FW Flow (% of $4x10^5$ lb/hr)	50	48	48	46	
Air Flow (% relative)	80	78	77	79	
Stm Hdr Press (psig)	302	302	301	301	
Grate Temps No. 1	316	325	323	315	
(°F) 2	324	320	323	327	
3	329	320	319	318	
4	321	329	324	328	
5	347	350	362	395	
6	324	324	326	334	
Blr Out Gas Temp (°F)	633	635	633	631	
AH Out Gas Temp (°F)	467	467	468	465	
Econ Out Gas Temp (°F)	370	370	371	371	
Furnace Air Temp (°F)	344	336	339	343	
Feedwater Temp (°F)	269	269	268	269	
Front OF Air, Top/Bottom (in H_2O)	5.8/5.4	5.7/5.4	5.7/5.4	5.7/5.4	
Rear OF Air, Top/Bottom (in H_2O)	5.9/5.5	5.9/5.5	5.9/5.6	5.8/5.6	
Reinj Air, Mech/AH/Blr (in H_2O)	5.5/8.5/9.0	5.5/8.5/9.0	5.5/9.0/9.0	5.5/9.0/9.0	
Mech Ash Reinj, Yes or No	NO	NO	NO	NO	
Blr Master Control (0-100%)	49	50	50	50	
Stoker Speed Control (0-100%)	46	49	49	49	
Air Flow Control (0-100%)	65	65	65	65	
Fur Draft Control (0-100%)	35	35	35	35	
Feedwater Control (0-100%)	42	45	46	44	
Stack Opacity (0-100%)	3.3	3.3	3.3	3.3	
COMMENTS:					

15900

SECTION 2.0

PARTICULATE DATA

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PARTICULATE DATA SUMMARY
PART I

LOCATION: A

TEST NO.	Total Mass mgm.	Dry Gas Volume ft^3	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H_2O	Pitot ΔP "H_2O	Orifice ΔH "H_2O	Stack Gas Temp. °R	Excess O_2 %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10^6BTU	Flue Gas MW g/g mole
3	684.2	40.590	66.4	23.59	-2.2	.1728	1.19	870	4.1	42	.377	.837	9973	29.72
4	649.2	39.194	64.0	24.03	-3.1	.213	1.203	893	6.3	42	.377	.837	9973	29.34
5	868.2	44.737	75.6	23.99	-3.1	.2238	.697	913	4.1	63	.317	.837	9973	29.63
6	1216.0	48.507	85.3	23.99	-4.2	.261	.81	917	5.8	63	.317	.837	9973	29.40
10	492.1	47.937	53.3	23.81	-2.2	.141	.759	852	7.9	63	.377	.837	9973	29.18
14	823.2	46.222	83.1	23.77	-3.7	.2633	.730	904	5.4	63	.317	.837	9973	29.33
15	716.5	43.972	72.2	23.81	-3.6	.2519	.679	914	4.5	63	.317	.837	9973	29.55
16A	518.1	39.019	66.6	23.66	-2.7	.2133	.5876	886	6.1	63	.317	.837	9818	29.29
16B	37.9	13.986	19.5	23.66	+5.5	.6933	.2375	775	7.45	30	.187	.666	9818	29.33
		82.768	115.2			1.493	1.104	776	7.45	90	.248	.666		
17A	26.4	56.782	76.7	23.77	+5.0	1.102	.2908	769	7.3	120	.188	.666	9818	29.49
17B	22.9	30.644	67.0	23.77	0.0	.2419	.3638	621	7.8	56	.248	.817	9818	28.83
		46.989	102.8			.2656	.4213	621	7.8	56	.316	.817		
21	9962.8	28.380	50.0	23.74	-.69	.1425	.6821	1121	4.5	42	.376	.837	9779	29.50
22	15760.6	31.940	60.6	23.74	-.66	.1658	.8092	1123	4.1	42	.376	.837	9779	29.45
23	5961.8	17.646	29.7	23.62	-.55	.0739	.3891	1032	4.4	34.5	.376	.837	9779	29.53
24	4719.1	19.806	34.2	23.62	-.42	.0813	.4344	1037	4.8	34.5	.381	.837	9779	29.47
26A	6393.3	23.358	52.3	23.77	-.54	.1121	.5899	1079	5.05	36	.381	.837	9779	29.09
26B	840.3	48.558	82.7	23.77	-4.4	.3052	.8157	929	4.6	63	.317	.837	9779	29.53
28	16263.9	26.413	47.0	23.78	-.74	.1663	.7958	1142	3.9	36	.382	.837	9779	29.42
29	12150.3	26.056	44.0	23.80	-.85	.1550	.7750	1145	3.8	36	.382	.837	9779	29.61

#15900 rev.

PARTICULATE DATA SUMMARY
PART I

LOCATION: A

TEST NO.	Total Mass mgm.	Dry Gas Volume ft^3	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H_2O	Pitot ΔP "H_2O	Orifice ΔH "H_2O	Stack Gas Temp. °R	Excess O_2 %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10^6BTU	Flue Gas MW g/g mole
34A	15337.1	48.900	46.0	23.69	-.70	.132	.667	1075	5.86	72	.381	.837	9823	29.78
34B	102.6	70.588	97.0	23.69	+5.2	1.674	.444	814	6.5	120	.188	.666	9823	29.42
35A	28172.9	52.660	68.5	23.62	-.7	.148	.748	1103	5.97	72	.381	.837	9823	29.53
35B	58.6	78.115	106.5	23.63	+6.5	2.11	.539	828	6.4	120	.188	.666	9823	29.44
36	12320.9	23.311	38.0	23.82	-.54	.1150	.5715	1096	4.7	36	.381	.837	9823	29.73
37	14734.4	23.638	43.0	23.64	-.53	.1258	.6283	1113	5.1	36.5	.381	.837	9823	29.46
38	3246.6	18.179	26.3	23.71	-.35	.0688	.3565	1042	4.7	36	.381	.837	9823	29.60
39	6665.7	17.918	32.0	23.71	-.35	.0658	.3494	1032	4.9	36	.381	.837	9823	29.36

#15900 rev.

PARTICULATE DATA SUMMARY
PART II

Location A

TEST NO.	LOAD %	O_2 %	CONDITIONS	EMISSIONS			Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %
				lb/10^6BTU	GR/SCF	LB/HR				
3	61	4.1	Mech outlet	0.582	0.329	153	8.92	33.25	905	114
4	60	6.3	Mech outlet	0.646	0.317	164	8.76	37.34	1006	101
5	72	4.1	Mech outlet	0.660	0.373	194	9.07	38.54	1014	108
6	70	5.8	Mech outlet	0.948	0.481	271	9.40	41.95	1095	108
10	37	9.9	Mech outlet	0.537	0.199	86	6.20	29.85	837	95
14	74	5.4	Mech outlet	0.663	0.345	196	9.67	42.05	1104	102
15	73	4.5	Mech outlet	0.572	0.315	174	8.89	41.16	1071	99
16A	59	6.1	Mech outlet	0.512	0.259	134	9.27	37.52	1004	94
16B	59	6.1	ESP outlet	.0166	.0076	4.04	7.68	67.13	1032	102
17A	52	6.3	ESP outlet	.0194	.0090	4.25	7.45	62.12	915	102
17B	52	6.3	Stack	.0128	.0057	2.82	11.52	33.48	958	104
21	82	4.5	Blr outlet, without reinjection	12.124	6.815	4275	9.50	34.21	1220	100
22	83	4.1	Blr outlet, with reinjection	16.631	9.575	6719	10.16	36.96	1365	102
23	59	4.4	Blr outlet, with reinjection	11.667	6.598	3098	9.17	23.68	913	101
24	59	4.8	Blr outlet, without reinjection	8.431	4.652	2288	9.38	24.92	956	105
26A	70	5.1	Blr outlet	9.771	5.308	3034	11.77	29.95	1111	106
26B	74	4.6	Mech outlet	.600	.335	201	9.20	45.78	1168	101
28	84	3.9	Blr outlet, 4" O.F. air	20.476	11.929	8026	9.57	37.32	1308	99
29	85	3.8	Blr outlet, 9" O.F. air	15.405	9.027	5839	9.12	35.95	1258	101

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#15900 Rev.

PARTICULATE DATA SUMMARY
PART II

Location A

TEST NO.	LOAD %	O_2 %	CONDITIONS	EMISSIONS lb/10^6BTU	EMISSIONS GR/SCF	EMISSIONS LB/HR	Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %
34A	76	5.9	Blr outlet, 10.5" O.F. air	11.887	6.102	3740	5.32	32.15	1193	96
34B	76	5.9	ESP outlet	.0576	.0283	16.0	7.59	78.97	1095	106
35A	76	6.0	Blr outlet, 5.5" O.F. air	20.481	10.436	6705	7.23	34.65	1249	100
35B	76	6.0	ESP outlet	.0296	.0146	9.0	7.55	89.32	1220	105
36	79	4.7	Blr outlet, without reinjection	18.506	10.229	5819	8.83	30.21	1106	103
37	87	5.1	Blr outlet, with reinjection	22.542	12.153	7181	9.82	32.11	1149	99
38	54	4.7	Blr outlet, 10.5" O.F. air	6.289	3.475	1568	7.96	22.88	878	100
39	60	4.9	Blr outlet, 3.0" O.F. air	13.258	7.238	3223	9.64	22.36	866	101

#15900 Rev.

PARTICULATE

DATA

Sampling Time Per Point, Min
2

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

ISOKINETICS = 111.4%

TEST NUMBER 3

DATE 8/11/77

OPERATOR JEC + RAP

FUEL Stansbury

SITE A

PROBE LOCATION Mech Out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.17	1.02	523.4	390	350	330		90	120		8
2		.17	1.02		410	340	300		80	120		7
3		.09	0.65		410	340	300		70	120		5
4		.19	1.35		420	330	250		80	125		10
5		.20	1.4		420	340	280		75	130		10
6		.13	0.9		420	360	290		80	120		7
7		.19	1.35	535.78	390	320	230		90	130		9.5
8		.17	1.2		410	320	250		80	140		9
9		.24	1.5		420	330	270		80	130		10
10		.19	1.3	546.15	400	320	270		80	130		7
11		.12	1.1		420	330	290		80	130		8
12		.14	1.0		420	340	300		80	140		8
13		.17	1.2	546.43	410	330	310		80	140		9
14		.17	1.2		420	330	320		80	140		9
15		.22	1.5		420	330	320		80	145		10
16		.16	1.1	552.81	400	320	280		90	150		8
17		.21	1.4		420	330	280		80	140		11
18		.17	1.2		420	330	300		80	140		10
19		.12	.9	557.07	380	350	330		85	150		7.5
20		.19	1.4		400	350	330		85	150		10
21		.22	1.4		410	350	330		85	150		11
				562.00								
Average		.1728	1.19	38.60	410							

METER VOL. END 562.00

START 523.40

SAMPLE VOL. 40.59 ft^3 corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
		23.59

Percent O_2 =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} = 400

T_{meter} = ΔP =

ΔH_g = Noz(Ideal) = .42

% H_2O = Noz(Actual) = .377

= .265

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	150	-	100	=	50
#2	105	-	100	=	5
#3	0	-	0	=	0
				Total	55

#4	g(End)		g(Start)		Δgrams
Silica Gel	171.2	-	159.8	=	11.4

Total Vol. H_2O 66.4 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
2

Leak Check Rate

	Vac in. Hg	ft³/min
Before	14.6	0.000
After		

ISOKINETICS = 99.0%

TEST NUMBER 4
DATE 8/12/77
OPERATOR RAP
FUEL Stonebury Coal
SITE 4
PROBE LOCATION mech out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	12:17	.30	1.32	564.0	425	280	330	5	100	115		11.2
2		.24	1.35	565.9	425	270	330		95	115		—
3		.14	.90	—	420	285	325		92	115		7.5
4	12:27	.16	1.05	569.26	400	295	330		95	118		8.5
5		.27	1.35	571.19	435	295	325		95	118		11.2
6		.26	1.35	573.10	430	300	320		95	118		11.0
7	12:38	.27	1.40	574.98	410	300	315		95	120		11.0
8		.23	1.40	576.89	418	310	320		92	120		11.0
9		.21	1.30	578.74	440	305	315		85	120		10.3
10	12:49	.12	.75	580.24	400	300	300		92	125		6.2
11		.14	.90	581.73	440	300	300		90	125		7.3
12		.14	.90	583.32	450	305	300		90	125		7.3
13	12:58	.29	1.40	585.72	430	300	300		88	125		11.0
14		.23	1.40	587.13	430	305	300		88	125		10.8
15		.21	1.30	588.95	450	310	310		80	128		10.0
16	13:06	.14	.90	590.48	425	310	305		80	129		6.9
17		.26	1.43	592.41	430	310	305		80	130		10.0
18		.26	1.42	594.32	450	310	305		78	130		10.8
19	13:15	.29	1.42	596.24	440	305	305		78	130		10.8
20		.21	1.30	598.04	430	305	305		78	130		10.0
21		.11	.70		450	305	305		78	125		5.5
Average		.213	1.203		432.7							

METER VOL. END 599.333
START 562.112
SAMPLE VOL. 37.221 ft³ unc.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		24.03

Percent O_2 =

Corr. Vol. 39.1944 ft³

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Nos(Ideal)=
% H_2O = Nos(Actual)= 3.77

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	135	100	35
#2	115	100	15
#3	1	0	1
		Total	51

#4	g(End)	g(Start)	Δgrams
Silica Gel	254.5	241.5	13.0

Total Vol. H_2O 64 ml

PARTICULATE

DATA

* 10 min Change
T.6

Sampling Time Per Point, Min
3

Leak Check Rate

	Vac in. Hg	ft^3/min
Before	14.0	0.000
After		

ISOKINETICS = _____ %

TEST NUMBER 5
DATE 8/18/77
OPERATOR RAP
FUEL STANSBURY
SITE A
PROBE LOCATION Mech. Out

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
1	11:51	.32	1.03	602.18	435	280	310		85	103		9.2
2	*	.24	.78	604.36	470	280	310		75	102		7.0
3		.12	.37	—	465	295	310		72	105		4.0
4	12:04	.17	.53	607.66	450	295	320		75	105		5.5
5		.29	.90	610.05	470	300	320		75	110		8.5
6		.30	.93	612.44	470	310	320		72	110		9.2
7	12:16	.32	.98	614.88	465	305	305		75	112		10.2
8		.25	.78	617.05	470	310	305		75	114		7.6
9		.20	.62	—	470	315	310		75	115		6.5
10	12:27	.13	.41	620.51	470	310	320		78	118		4.8
11		.12	.39	622.05	460	310	315		73	120		4.7
12		.15	.45	623.63	450	310	315		75	120		5.2
13	12:40	.30	.93	626.03	450	300	320		75	125		9.2
14		.26	.80	628.21	455	305	320		72	125		8.2
15		.19	.58	630.00	455	310	320		72	125		6.3
16	12:54	.16	.49	631.69	440	290	310		80	130		5.6
17		.27	.84	633.96	445	295	310		75	130		8.5
18		.27	.84	636.23	460	300	310		72	132		8.8
19	13:06	.28	.87	638.47	435	295	305		75	132		9.0
20		.25	.78	640.58	445	300	310		72	135		8.2
21		.11	.34	642.084	435	300	310		75	135		
Average		.224	.697		452							

METER VOL. END 642.084
START 599.542
SAMPLE VOL. 42.54 ft^3 Unc.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		23.99

Percent O_2 =

Corr. vol. 44.737 ft^3

Nomograph Setup

P_{meter} = C = .47
P_{stack} = T_{stack} = .430
T_{meter} = ΔP =
ΔH_g = .91 Noz(Ideal) =
% H_2O = 9.3 Noz(Actual) = .317
Y = .58

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	157	-	100	=	57
#2	108	-	100	=	8
#3	0	-	0	=	0
				Total	65

#4	g(End)		g(Start)		Δgrams
Silica Gel	244.0	-	233.4	=	10.6

Total Vol. H_2O 75.6 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
3

Leak Check Rate

	Vac in. Hg	ft³/min
Before	15"	0.00
After		

ISOKINETICS = 108 %

TEST NUMBER 6
DATE 9/18/77
OPERATOR RAP & GLM
FUEL Stansbury
SITE A
PROBE LOCATION mach out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
								Impingers				
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	In	Out	Meter		
1	15:36	.35	1.09	644.82	445	320	290		75"	112		9.3
2		.27	.85	647.21	445"	320	285		65	112		7.2
3		.14	.42	648.84	430	315"	280		65"	112		4.5
4	15:49	.21	.65	650.90	440	300	275"		69	115"		6.0
5"		.33	1.02	653.46	450	300	280		65"	115"		8.7
6		.31	.98	655.90	450	300	280		65	115"		7.4
7	16:04	.35	1.09	658.60	460	290	290		72	120		9.3
8		.26	.82	660.83	460	285"	295		65"	120		7.2
9		.26	.82	663.13	460	300	300		65	120		7.2
10	16:15"	.15"	.46	664.39	460	300	300		70	122		4.5"
11		.14	.43	666.46	470	300	300		70	122		4.5"
12		.18	.56	668.34	410	300	305"		70	125"		5.2
13	16:25"	.37	1.16	670.90	460	300	310		71	125"		10.2
14		.30	.93	673.30	480	305	310		70	128		8.8
15"		.28	.87	675.50	430	305	310		70	128		8.2
16	16:38	.18	.56	677.38	470	300	320		75	130		6.2
17		.32	.98	679.72	435	300	315"		72	130		10.0
18		.30	.93		470	305"	310		72	132		9.4
19	16:52	.37	1.15	682.57	480	295"	315		75"	133		11.5"
20		.29	.90	686.84	470	295"	310		75"	133		9.6
21		.12	.34	688.325"	455	295"	310		78	135"		4.8
Average		.261	.81		457							

METER VOL. END 684.335
START 642.208
SAMPLE VOL 46.127 ft³ unc.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.83	23.68	23.99

Percent O_2 = 5.8

Corr. Vol. 48.5074

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} = 450
T_{meter} = ΔP =
ΔH_g = .91 Noz(Ideal) =
% H_2O = 9.4 Noz(Actual) = .917
Y = .60

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	165	100	65
#2	108	100	8
#3	1	0	1
		Total	74

#4 Silica Gel	g(End)	g(Start)	Δgrams
	246.3	235	11.3

Total Vol. H_2O 85.3 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
3

Leak Check Rate

	Vac in. Hg	ft³/min
Before	15"	0.00
After		

ISOKINETICS = 95 %

TEST NUMBER 10
DATE 8/24/77
OPERATOR RAP
FUEL Stansbury Coal
SITE A
PROBE LOCATION Mech 0.5

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
1	10:15	.17	.90	691.18	390	280	320		82	92		8.0
2		.14	.74	693.41	395	290	325		65	95		7.2
3		.07	.37	694.97	395	280	320		65	100		3.6
4	10:38	.09	.48	696.74	390	280	320		65	100		4.3
5		.17	.90	699.22	395	280	310		65	100		7.3
6		.17	.90	701.58	390	290	280		65	102		7.5
7	10:40	.18	.97	704.12	380	280	300		70	102		7.8
8		.15	.80	706.31	400	280	270		68	105		6.5
9		.12	.64	708.49	375	275	305		75	110		5.3
10	10:58	.13	.69	710.57	390	280	310		67	110		5.5
11		.10	.54	712.44	400	290	325		65	100		5.0
12		.12	.64	714.46	360	310	335		70	115		5.4
13		.20	1.08	717.53	390	300	320		70	118		8.3
14		.16	.87	719.78	410	310	335		75	115		7.9
15		.16	.87	722.08	375	320	335		65	115		6.8
16		.08	.49	723.70	380	300	325		72	120		4.1
17		.17	.92	726.05	410	315	320		75	110		7.1
18		.17	.92	728.37	400	320	325		75	120		7.1
19	11:42	.19	1.03	730.73	400	310	315		80	120		8.0
20		.14	.76	732.81	410	315	330		70	120		6.0
21		.08	.43	734.39	400	300	315		75	120		3.9
Average		.141	.759		392.1							

METER VOL. END 734.39
START 688.623
SAMPLE VOL. 45.768 ft³ unc.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
83	23.65	23.81

Percent O_2 = 9.9

Corr. vol. 47.937 ft³

Nomograph Setup

F_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal) =
% H_2O = Noz(Actual) = .377
$\bar{\eta}$ = .75

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	136	-	100	=	36
#2	105	-	100	=	5
#3	0	-	0	=	0
				Total	41

#4	g(End)		g(Start)		Δgrams
Silica Gel	222.0	-	209.7	=	12.3

Total Vol. H_2O 57.3 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
3

Leak Check Rate

	Vac in. Hg	ft^3/min
Before	15"	0.00
After		

ISOKINETICS = 102 %

TEST NUMBER 14
DATE 8/26/77
OPERATOR RT + RAP
FUEL STANSBURY
SITE A
PROBE LOCATION Mech. OJ

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
1	11:20	.34	.95	739.35	420	275	250		70	90		7.8
2		.29	.82	741.59	440	280	265		70	80		6.5
3		.16	.45	743.48	440	300	280		70	80		4.8
4	11:33	.19	.54	745.37	410	290	275		70	85		4.9
5		.35	.98	747.76	450	295	285		70	95		7.9
6		.35	.98	750.26	450	305	290		65	95		7.9
7	11:45	.38	1.07	752.75	430	300	310		70	90		8.8
8		.31	.87	755.08	460	300	310		70	85		7.0
9		.26	.73	757.21	450	305	315		70	85		6.1
10	12:10	.21	.58	759.07	440	290	320		70	110		5.0
11		.16	.43	760.67	450	300	320		70	110		4.1
12		.21	.58	762.55	380	300	315		70	105		5.0
13	12:25	.36	.98	764.99	450	300	320		70	115		8.0
14		.27	.74	767.12	460	300	320		70	115		6.3
15		.25	.68	769.13	460	305	315		70	105		6.0
16	12:40	.16	.44	770.71	460	290	335		70	115		4.4
17		.30	.82	772.94	460	290	335		70	110		7.0
18		.30	.82	775.17	460	300	330		70	110		7.0
19	13:00	.33	.90	777.45	450	295	330		70	120		7.7
20		.23	.64	779.41	460	300	335		70	115		5.8
21		.12	.33	780.762	440	290	330		70	110		3.8
Average												

METER VOL. END 780.762
START 736.808
SAMPLE VOL. 43.954 ft^3 Vac.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.83	23.50	23.77

Percent O_2 = 5.4

corr. vol. 46.222 ft^3

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Nox(Ideal) =
% H_2O = Nox(Actual) = .317
$\bar{\pi}$ = .69

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	165	-	100	=	65
#2	110	-	100	=	10
#3	0	-	0	=	0
				Total	75

#4	g(End)		g(Start)		Δgrams
Silica Gel	158.5	-	150.6	=	8.1

Total Vol. H_2O 83.1 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

ISOKINETICS = 99 %

Sampling Time Per Point, Min	Before	After
3		

TEST NUMBER 15
DATE 8/27/77
OPERATOR RAP
FUEL STANSBURY
SITE A
PROBE LOCATION Mech out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	11:27	.30	.82	784.16	440	300	310		96	105		6.7
2		.27	.75	786.35	440	305	320		68	108		8.7
3		.13	.35	787.82	390	290	300		90	112		3.4
4	12:10	.18	.48	—	440	310	330		75	115		4.2
5		.33	.87	791.87	450	310	310		70	112		6.7
6		.32	.85	794.20	445	295	310		68	112		6.5
7	12:27	.34	.91	—	445	305	300		72	118		6.8
8		.29	.78	798.65	460	305	315		75	118		5.9
9		.21	.57	800.51	460	320	320		68	120		4.7
10		.21	.57	802.48	455	300	310		70	123		4.7
11		.15	.40	803.87	465	310	310		72	123		3.5
12		.18	.52	805.62	465	305	305		72	125		4.5
13	12:54	.35	.94	807.99	465	290	310		70	125		7.1
14		.26	.69	809.97	470	300	300		70	125		5.5
15		.28	.75	812.10	430	290	300		70	125		5.9
16	13:08	.17	.46	813.68	470	300	290		70	130		—
17		.32	.86	815.90	470	300	290		70	130		6.7
18		.31	.84	818.07	470	300	300		68	132		6.5
19		.34	.92	820.37	470	300	300		68	135		7.2
20		.22	.58	822.17	470	290	295		68	135		4.9
21	13:30	.13	.35	823.564	470	300	290		70	135		3.7
Average		.2514	.6790		454.3							

METER VOL. END 823.564
START 781.750
SAMPLE VOL 41.814 ft^3 Dry Gas

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.83	23.54	23.81

Percent O_2 = 4.5

Corr. Vol. 43.97764 ft^3

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal)=
% H_2O = Noz(Actual)= .317
T = .69

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	154	- 100	= 54
#2	106	- 100	= 6
#3	1	- 0	= 1
		Total	61

#4 Silica Gel	g(End)	g(Start)	Δgrams
	165.9	- 154.7	= 11.2

Total Vol. H_2O 72.2ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min — Before — After

ISOKINETICS = 94 %

Sampling Time Per Point, Min
3

TEST NUMBER 16A
DATE 8/30/77
OPERATOR RAP & RT
FUEL STANWAY + Kraft
SITE A
PROBE LOCATION Mech OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	12:18	.25	.68	827.47	420	290	360		80	130		6.0
2		.23	.64	829.34	430	295	370		80	130		5.8
3		.10	.27	830.51	420	295	370		75	150		3.1
4	12:33	.17	.47	832.11	420	285	350		80	135		4.4
5		.28	.77	834.13	430	295	360		80	120		6.9
6		.27	.74	836.15	400	300	360		75	140		6.8
7	12:48	.28	.77	838.20	410	300	340		75	145		6.9
8		.19	.53	839.85	440	300	350		80	130		5.1
9		.20	.55	841.54	435	300	355		80	140		5.1
10	13:03	.14	.39	843.07	430	300	350		60	140		4.0
11		.20	.55	844.76	440	290	350		80	150		5.1
12		.17	.47	846.39	380	290	310		75	135		4.4
13	13:19	.28	.77	848.42	410	285	340		80	130		6.9
14		.20	.55	850.13	430	290	335		75	125		5.1
15		.24	.66	851.97	400	290	310		70	135		5.9
16	13:30	.16	.44	853.51	400	285	320		80	120		4.3
17		.26	.72	855.49	450	285	315		80	115		6.5
18		.25	.69	857.41	450	295	315		80	130		6.2
19		.27	.74	859.40	430	280	320		80	130		6.7
20		.15	.50	861.01	460	285	320		85	130		4.9
21		.16	.44	862.537	450	290	320		85	130		4.4
Average		.2153	.5876		426							

METER VOL. END 862.537
START 825.433
SAMPLE VOL 37.104 ft^3 Unc

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.827	27.46	23.66

Percent O_2 = 6.1

Corr. Vol. 39.019 ft^3

Nonograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal)=
% H_2O = Noz(Actual)=
=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	148	100	48
#2	105	100	5
#3	2	0	2
		Total	55

#4 Silica Gel	g(End)	g(Start)	Δgrams
	163.8	152.2	11.6
		Total Vol. H_2O	66.6 ml

PARTICULATE

DATA

* Nomograph change

Nozzle change at point #7
To .248" dia.

Sampling Time Per Point, Min
5

Leak Check Rate

	Vac in. Hg	ft^3/min
Before	15.0	0.00
After		

ISOKINETICS = 102 %

TEST NUMBER 16B
DATE 8/30/77
OPERATOR RAP
FUEL Stansbury + bituminous
SITE A
PROBE LOCATION ESP OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	1:00	.42	.155	—	310	340	340		72	75		2.2
2		.65	.24	623.19	315	350	340		68	78		3.0
3		.80	.30	625.60	315	300	275		65	80		3.2
4		.85	.32	628.03	315	260	300		62	82		—
5		.87	.24	630.17	320	300	300		70	90	*1.62	2.8
6		.62	.17	631.920	315	300	300		65	92		2.8
				631.980		New	Nozzle				*2.2	
7		.70	.54	635.11	315	300	280		70	95		4.2
8	1:34	.94	.82	638.83	315	350	300		70	95		6.0
9		1.20	1.00	642.95	315	290	300		68	98	*2.5	7.5
10		1.10	1.05	647.13	315	270	300		62	98		7.5
11		1.30	.97	651.12	315	285	300		62	94		6.5
12		1.10	.82	654.835	315	285	300		60	100		5.8
13	13:54	1.3	.97	658.82	315	330	290		65	102		6.7
14		1.5	1.12	663.06	315	350	300		60	103		7.7
15		1.70	1.28	667.50	320	320	310		60	102		8.5
16		1.70	1.28	671.98	320	285	300		60	102		8.5
17		1.50	1.12	676.20	320	275	300		60	102		7.7
18		1.20	.90	680.05	315	285	310		62	102		6.2
19		1.25	1.35	684.89	315	320	280		72	100		8.3
20		2.10	1.4	—	315	320	295		65	100		9.5
21		2.50	1.40	694.31	320	330	300		63	100		9.5
22		1.90	1.40	699.01	315	310	300		62	99		9.5
23		1.75	1.35	703.69	315	300	300		60	99		9.0
24		1.35	1.05	708.012	315	290	300		60	100		7.0
Average		.6933	.2375	1-6	315							
		1.493	1.104	7-24	316							

METER VOL. END 708.012
START 619.072
SAMPLE VOL. [ ] ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.666	24.06	23.66

Percent O_2 = [ ]

88.940 ft^3 Corr. First Nozzle
82.768 ft^3 " Second Nozzle

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= .187
Y = 5.0

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	195	100	95
#2	118	100	18
#3	1	0	1
		Total	114

#4 Silica Gel	g(End)	g(Start)	Δgrams
	174.8	154.1	20.7
		Total Vol. H_2O	134.7 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5

Leak Check Rate

	Vac in. Hg	ft³/min
Before	15"	0.00
After		

ISOKINETICS = 102%

TEST NUMBER 17A
DATE 8/31/77
OPERATOR JEC
FUEL STAN + Kem Coal
SITE A
PROBE LOCATION ESP OUT

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
1	15:28	.60	.16	——	320	350	270		70	73		2.5
2		.54	.14	711.38	315	330	300		65	75		2.2
3		.67	.175	713.08	315"	300	320		62	80		2.5"
4		.72	.19	714.87	315	285"	300		60	82		1.5"
5"		.62	.165"	716.45"	315"	280	535"		58	85		2.3
6		.45"	.12	717.81	310	320	335		55	92		2.0
7		.50	.13	719.31	310	350	320		62	98		2.2
8		.65"	.17	720.92	310	250	320		62	98		2.3
9	10:27	.85"	.22	722.83	310	350	325		62	101		2.8
10		1.0	.26	724.98	310	340	320		62	102		3.3
11		.95"	.25"	727.12	310	310	330		52	103		3.2
12		.80	.21	729.07	305"	305"	330		50	108		2.8
13	17:20	1.1	.29	731.24	305	300	300		70	105		5.5
14		1.2	.31	732.65"	305	310	320		58	105		3.6
15		1.3	.34	736.15"	305	320	320		55"	103		3.9
16		1.4	.37	738.64	305"	300	300		58	108		4.0
17		1.3	.34	741.07	305"	295"	340		55"	110		3.9
18		1.10	.29	743.30	305"	290	325		55	110		3.5
19		1.70	.45"	——	305"	320	300		65"	110		4.5
20	18:10	2.0	.52	749.07	305"	350	295"		65	110		5.0
21		2.2	.57	752.13	305"	300	280		62	110		5.5
22		1.80	.50	755.04	305"	290	280		60	110		4.9
23		1.8	.50	757.96	305	290	290		62	110		4.9
24		1.20	.31	760.33	305	285"	290		62	110		3.7
Average		1.102	.2908		309							

METER VOL. END 760.538
START 708.177
SAMPLE VOL. 52.161 ft³ Dia.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.666	24.14	23.77

Percent O_2 = 7.3

Corr. Vol. = 56.782 ft³

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal) =
% H_2O = 7.3 Noz(Actual) = .188
▼ = 7.0

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	160	100	60
#2	104	100	4
#3	1	0	1
		Total	65

#4 Silica Gel	g(End) 1726	g(Start) 160.9	Δgrams 11.7

Total Vol. H_2O 76.7 ml

PARTICULATE

DATA

* Nomograph change

Sampling Time Per Point, Min
7

Leak Check Rate — Vac in. Hg — ft^3/min

Before

After

ISOKINETICS = 104%

TEST NUMBER 17D

DATE 8/31/77

OPERATOR GLM

FUEL Stan + Kan Coal

SITE A

PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	15:41	.22	.29	871.90	160	200	230		54	45		29
2	15:49	.225	.30	875.32	152	240	260		43	49		3.0
3	15:57	.28	.37	879.91	168	225	270		35	51		3.4
4	16:04	.21	.28	882.07	175	275	290		38	53		2.9
5	16:13	.28	.37	885.78	170	250	300		38	65		3.4
6	16:25	.275	.50	889.92	150	225	290		48	70	*1.0	—
7	16:37	.23	.40	894.10	158	210	295		45	65		4.4
8	16:41	.215	.40	897.702	158	215	315		48	78		3.5
Avg.		.24194	.3638	897.860 (START)	161							
	Nozzle change to .316" dia											
1	17:43	.210	.88	903.435	155	220	265		65	75	*.45	7.1
2	17:52	.220	.90	909.10	157	275	320		68	75		7.3
3	18:02	.25	.93	914.72	172	250	300		60	65	*.58	7.5
4		26	.98	920.440	168	225	300		58	70		7.9
5	18:18	.31	1.05	926.468	148	240	335		50	80	*.55	8.6
6		.275	.95	931.766	172	260	290		50	90	*.65	—
7		.35	1.08	937.628	140	200	300		55	65		8.6
8	18:45	.25	.7	942.543	172	270	330		58	80	*.66	6.0
Average		.2556	.9215		161							

METER VOL. END 942.543

START 864.562

SAMPLE VOL. ____ ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.83	27.75	23.75

Percent O_2 = 7.8

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal)=

% H_2O = Noz(Actual)= .248

F = 1.4

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	239	100	139
#2	121	100	21
#3	1	0	1
		Total	161

#4 Silica Gel	g(End)	g(Start)	Δgrams
			8.8

Total Vol. H_2O 169 ml

17D Dry gas vol.

Pr. A 30.644 ft^3 (corr. vol

Pr. B 26.989 ft^3

PARTICULATE

DATA

Sampling Time Per Point, Min
3

Leak Check Rate

	Vac in. Hg	ft³/min
Before	15	0.00
After		

ISOKINETICS = 100 %

TEST NUMBER 21
DATE 9/23/71
OPERATOR JEC
FUEL Kemmerer Coal
SITE A
PROBE LOCATION BLROST

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.03	.23	817.83	680	290	300		90	110		3.0
2		.22	1.0	820.14	700	350	300		75	110		7.0
3		.15	.70	822.07	700	450	300		75	110		5.0
4		.18	.825	824.23	660	400	275		75	110		6.7
5		.12	.78	825.24	660	530	280		75	115		6.1
6		.20	.92	825.99	680	330	280		80	115		7.0
7		.17	.78	826.89	660	330	275		75	115		6.0
8		.10	.46	827.81	650	340	275		75	120		4.2
9		.03	.15	828.28	680	330	285		90	120		2.5
10		.17	.83	829.34	660	300	285		90	120		6.3
11		.19	.925	830.57	700	340	290		70	120		7.2
12		.12	.54	831.38	680	360	295		75	120		5.0
13		.104	.195	831.89	600	350	295		80	120		2.9
14		.13	.64	832.82	700	350	300		80	120		5.3
15		.13	.64	833.75	700	370	300		75	120		5.8
16		.10	.49	834.56	680	370	300		75	120		4.5
17		.14	.68	835.48	600	350	300		90	120		5.2
18		.19	.925	836.61	660	350	300		80	120		7.2
19		.18	.86	837.70	680	375	300		70	120		7.2
20		.11	.54	838.58	680	385	300		70	120		5.6
21		.13	.64	839.57	600	360	300		50	125		5.9
22		.19	.92	840.64	640	370	310		75	125		8.0
23		.16	.78	841.65	660	380	310		80	125		6.8
24		.17	.85	842.70	660	385	310		85	130		7.0
Average		.1475	.6821		661.6							

METER VOL. END 842.70
START 816.680
SAMPLE VOL. 26.02 ft^3 d.c.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	23.69	23.74

Percent O_2 =

Corr. Vol = 28.38

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal)=
% H_2O = Noz(Actual)= .376
Y =

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	137	-	100	=	37
#2	105	-	100	=	5
#3	0	-	0	=	0
				Total	42

#4	g(End)		g(Start)		Δgrams
Silica Gel	2453	-	2373	=	8.0

Total Vol. H_2O 50.0 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
2

Leak Check Rate

	Vac in. Hg	ft³/min
Before	15.0"	0.00
After		

ISOKINETICS = 102.

TEST NUMBER 22
DATE 9/23/77
OPERATOR RAP
FUEL Kerosene
SITE A
PROBE LOCATION

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.15	.73	844.13	640	300	260	5	90	110		5.0
2		.21	1.0	845.31	660	340	260		60	110		5.3
3		.17	.84	846.40	670	375	290		65	110		5.1
4		.12	.58	847.34	675	390	260		70	110		4.1
5		.19	.93	848.66	630	380	330		75	110		5.9
6		.20	.98	849.84	680	390	340		80	110		6.0
7		.18	.88	850.95	700	400	350		80	110		6.0
8		.12	.54	851.89	680	400	360		80	115		4.7
9		.05	.22	852.47	600	385	360		80	115		2.9
10		.19	.93	853.54	690	390	360		80	120		6.0
11		.18	.88	854.69	720	400	370		85	120		6.0
12		.14	.69	855.68	710	395	375		80	120		5.3
13		.03	.15	856.13	600	360	360		80	120		2.6
14		.23	1.10	857.32	680	335	360		80	120		7.0
15		.20	.98	858.47	700	350	360		80	120		7.0
16		.14	.69	859.41	700	350	360		80	120		5.4
17		.20	.98	860.27	620	330	360		80	120		7.1
18		.21	1.05	861.89	650	330	360		80	120		7.6
19		.20	.98	862.95	670	330	360		80	125		7.0
20		.13	.64	863.80	628	325	360		80	125		5.1
21		.14	.69	865.72	640	310	360		85	125		6.0
22		.23	1.16	868.08	660	330	360		80	130		8.0
23		.17	.83	870.19	680	370	360		80	130		7.0
24		.20	.98	872.41	640	370	360		90	130		7.9
Average		.165	.811		663							

METER VOL. END 872.41
START 843.07
SAMPLE VOL. 29.34 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	23.69	29.74

Percent O_2 =

31.940 corr. vol

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Nos(Ideal)=
% H_2O = Nos(Actual)= .376
=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	143	- 100	= 43
#2	110	- 100	= 10
#3	0	- 0	= 0
		Total	53

#4 Silica Gel	g(End)	g(Start)	Δgrams
	2132	- 2056	= 7.6

Total Vol. H_2O 606 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min	Before	After
15		

ISOKINETICS = 101 %

TEST NUMBER 23
DATE 9/24/77
OPERATOR RAP
FUEL KEMMERER COAL
SITE A
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.05	.26	873.52	580	320	350		110	120		2.4
2		.10	.54	874.36	540	350	350		100	125		3.5
3		.07	.38	875.10	600	380	350		90	125		3.0
4		.10	.54	875.96	580	400	350		95	125		3.5
5		.08	.43	876.74	500	390	350		95	125		3.2
6		.10	.54	877.62	570	370	350		90	125		3.7
7		.09	.48	878.40	540	365	350		90	130		3.3
8		.05	.26	879.06	580	350	350		90	130		2.5
9		.01	.05	879.27	520	335	350		110	130		1.0
10		.09	.48	880.10	570	330	348		100	130		3.5
11		.09	.48	880.90	600	350	350		90	130		3.5
12		.05	.26	881.50	600	360	350		90	130		2.5
13		.00										
14		.06	.32	882.16	550	360	350		100	130		3.0
15		.06	.32	882.85	600	360	350		95	130		3.0
16		.05	.26	883.45	600	370	350		95	130		2.5
17		.09	.48	884.20	500	370	350		100	135		3.3
18		.09	.48	884.98	560	370	350		90	135		4.1
19		.07	.27	885.56	540	380	360		90	135		2.4
20		.06	.32	886.21	600	310	300		95	140		2.4
21		.07	.37	886.90	520	310	360		100	140		3.0
22		.08	.42	887.56	560	370	360		95	140		3.0
23		.16	.53	888.40	600	370	360		90	140		3.5
24		.09	.48	889.13	600	380	360		90	140		3.0
Average		.07	.3841		572.7							

METER VOL. END 889.13
START 872.94
SAMPLE VOL 16.19 ft^3 U.C.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.877	23.58	23.62

Percent O_2 =

Corr. vol. = 17.6464 ft^3

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Nox(Ideal) =
% H_2O = Nox(Actual) = .376

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	111	-	100	=	11
#2	114	-	100	=	14
#3	0	-	0	=	0
				Total	25

#4 Silica Gel	g(End)		g(Start)		Δgrams
	156.5	-	151.8	=	4.7
				Total Vol. H_2O	29.7 ml

PARTICULATE

DATA

Leak Check Rate

Vac in. Hg | ft^3/min

Before

After

Sampling Time Per Point, Min
1.5

ISOKINETICS = 105 %

TEST NUMBER 24
DATE 9/24/77
OPERATOR R&P
FUEL Kemmerer
SITE A
PROBE LOCATION BLR09

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	15:29	.08	.43	—	560	340	290	5	75	115		4.0
2		.10	.54	891.01	570	345	300		75	115		4.5
3		.07	.38	891.77	580	250	310		80	116		3.8
4		.09	.48	892.60	580	350	310		73	118		4.1
5	15:45	.09	.48	893.43	570	310	320		80	120		4.3
6		.10	.54	894.32	580	310	320		78	120		4.8
7		.09	.48	895.14	590	315	330		75	121		4.5
8		.06	.33	895.87	580	310	320		75	121		3.7
9		—	—	negative								
10		.08	.43	896.67	570	275	320		85	122		4.2
11		.08	.43	897.46	590	280	320		78	122		4.2
12		.06	33	898.14	680	285	320		78	122		3.7
13		.02	.011	—	550	270	310		88	123		2.3
14	16:31	.10	.54	899.45	565	270	310		80	125		5.0
15		.10	.54	900.33	590	290	310		79	125		5.0
16		.06	.33	901.04	595	310	310		79	125		3.8
17		.09	.48	—	560	280	310		84	125		4.7
18		.10	.54	902.57	570	295	310		80	125		5.0
19		.09	.48	903.38	580	300	305		80	125		4.8
20		.04	.22	904.13	590	300	300		80	125		3.0
21	16:47	.06	.33	—	560	290	310		90	129		3.3
22		.12	.65	905.80	580	310	310		82	129		5.7
23		.09	.48	906.62	595	320	310		82	129		4.7
24		.10	.54	907.508	580	330	310		85	129		5.1
Average		.0813	.4344		576.7							

METER VOL. END 907.508
START 889.314
SAMPLE VOL 18.194 ft^3/vac

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	23.59	23.62

Percent O_2 =

Corr. Vol. = 19.806 ft^3

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔF =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= .381
=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	130	100	30
#2	102	100	2
#3	0	0	0
		Total	32

#4 Silica Gel	g(End)	g(Start)	Δgrams
	158.7	156.5	2.2
		Total Vol. H_2O	34.2ml

PARTICULATE

DATA

* nomograph Change

Sampling Time Per Point, Min
1.5

Before

After

Leak Check Rate

Vac in. Hg ft³/min

ISOKINETICS = 106%

TEST NUMBER 26A

DATE 10/6/77

OPERATOR RAP

FUEL Kemmerer Coal

SITE A

PROBE LOCATION QLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	10:27	.07	.38	908.45	620	270	330		100	120		3.5
2		.18	.97	909.62	620	285	325		90	119		6.0
3		.15	.80	910.70	625	320	320		70	119		5.2
4		.15	.80	——	625	325	325		78	119		5.2
5	10:41	.14	.75	912.83	610	320	320		82	120		5.0
6		.16	.86	913.92	620	320	320		80	121		5.8
7		.15	.80	914.99	620	325	320		75	121		5.2
8		.09	.48	915.83	615	330	330		75	122		3.2
9		.02	.108	916.24	600	285	320		90	125		2.0
10		.12	.64	917.20	620	240	320		85	125		4.8
11		.13	.70	918.15	640	320	325		75	128		5.0
12		.09	.48	918.96	650	320	320		75	128		4.0
13	11:27	.01	.05	919.30	600	300	315		100	132	*	6.2
14		.11	.57	920.10	610	315	315		90	130		4.5
15		.12	.62	921.03	650	330	320		80	130		4.8
16		.10	.51	921.870	650	330	320		72	130		4.3
				922.005	Leak Check OK							
17	11:42	.13	.67	923.000	610	270	310		81	130		5.0
18		.13	.67	923.95	630	270	310		77	131		4.9
19		.12	.62	924.90	635	275	310		72	130		4.7
20		.08	.41	935.64	610	270	300		78	132		3.8
21		.11	.57	926.52	600	275	300		83	132		4.3
22		.11	.57	927.40	610	275	300		83	132		4.3
23		.09	.41	928.14	640	290	300		75	132		3.6
24		.14	.72	929.142	520	310	300		78	133		5.0
Average		.12	.59		618.7							

METER VOL. END 929.142

START 707.685

SAMPLE VOL 221.457 ft³ wc

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	23.73	23.77

Percent O_2 =

Corr. vol. = 23.358 ft³

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal) =

% H_2O = 1.5 Noz(Actual) = .381

Y = .35

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	140	- 100	= 40
#2	107	- 100	= 7
#3	0	- 0	= 0
		Total	47

	g(End)	g(Start)	Δgrams
#4 Silica Gel	160.6	- 155.3	= 5.3
		Total Vol. H_2O	52.3 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min
3

Before

After

ISOKINETICS = 101 %

TEST NUMBER 26B
DATE 10/6/77
OPERATOR RAP
FUEL Kemmerer Coal
SITE A
PROBE LOCATION Mech. out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.39	1.05	961.740	480	340	310		90	125		
2		.32	.87		480	340	310		75	125		
3		.13	.35		460	340	310		80	130		
4		.18	.50		440	340	300		80	130		
5		.35	.95	979.45	480	330	280		75	130		
6		.33	.90		480	325	290		85	135		
7		.42	1.15	984.83	450	340	300		80	135		
8		.38	1.05		470							
9		.35	.94		480	325	315		83	140		
10		.17	.45	989.73	480	270	300		95	140		
11		.20	.53		480	290	300		85	140		
12		.25	.69		460	310	310		85	145		
13		.40	1.05	995.405	460	300	310		85	145		
14		.38	1.0		480	310	320		85	150		
15		.31	.85		480	315	320		85	150		
16		.15	.399	1002.015	460	315	320		87	150		
17		.39	1.01		475	310	325		85	150		
18		.35	.90		460	315	330		85	150		
19		.38	1.0	1008.420	460	310	330		90	155		
20		.40	1.05		460	310	330		85	155		
21		.18	.45	1014.915	460							
Average		.3052	.8157		468.3							

METER VOL. END 1014.415
START 968.740
SAMPLE VOL 46.175 ft^3 Unc.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	23.45	23.77

Percent O_2 =

Corr. Vol. = 41.5584 ft^3

Nomograph Setup

T_{meter} = C =
T_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Nos(Ideal) =
% H_2O = Nos(Actual) =
▼ = .68

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	165	100	65
#2	107	100	7
#3	1	0	1
		Total	73

#4 Silica Gel	g(End)	g(Start)	Δgrams
	170.3	160.6	9.7
		Total Vol. H_2O	82.7 ml

PARTICULATE

DATA

* nomograph change

Sampling Time Per Point, Min
1.5

Leak Check Rate — Vac in. Hg — ft^3/min

Before

After

ISOKINETICS = 99 %

TEST NUMBER 28

DATE 10/10/77

OPERATOR RAP

FUEL Kemmerer Coal

SITE A

PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
1	11:43	.17	.88	930.70	650	280	310		90	115		7.2
2		.22	1.13	931.95	665	310	310		75	115		8.2
3		.18	.93	933.09	685	320	310		70	118		7.0
4		.19	1.0	934.26	680	330	320		72	118		7.3
5	11:52	.23	1.20	935.55	670	320	320		73	120		8.5
6		.22	1.13	936.79	700	330	320		70	120		8.0
7		.20	.93	—	700	330	325		72	121	*	7.0
8		.11	.52	938.80	680	320	320		70	122		4.5
9		.01	.03	939.07	670	290	320		85	125		<20
10		.16	.74	940.10	680	280	320		85	125		5.8
11		.17	.78	941.12	720	290	320		72	126		6.2
12		.15	.69	942.10	710	305	305		70	127		5.5
13		.02	.08	942.43	650	270	310		82	130		2.0
14	12:21	.22	1.02	943.60	680	270	310		80	130		8.0
15		.23	1.05	944.78	700	290	310		68	130		8.2
16		.12	.56	945.64	700	310	310		60	130		5.2
17		.07	.32	946.32	670	270	300		80	135		3.8
18		.22	1.02	947.48	695	280	310		70	135		8.0
19		.21	.98	948.62	690	310	310		62	135		7.6
20		.11	.52	949.45	690	305	300		63	135		4.8
21	12:44	.14	.64	950.40	660	280	300		78	140		5.5
22		.25	1.15	951.61	665	280	300		72	138		8.8
23		.19	.88	952.70	680	290	300		73	140		7.2
24		.20	.92	953.788	680	300	300		73	139		7.3
Average		.1663	.7958		683							

METER VOL. END 953.788

START 929.525

SAMPLE VOL 24.263 ft^3 unc.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	23.73	23.78

Percent O_2 =

Corr. Vol. = 26.413 ft^3

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Nos(Ideal) =

% H_2O = Nos(Actual) = .382

$\bar{\Psi}$ = .36

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	136	-	100	=	36
#2	105	-	100	=	5
#3	0	-	0	=	0
				Total	41

#4	g(End)		g(Start)		Δgrams
Silica Gel	163.4	-	157.4	=	6

Total Vol. H_2O 47 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min	Before	After
1.5		

ISOKINETICS = 101 %

TEST NUMBER 59
DATE 10/10/77
OPERATOR RAP
FUEL Kentucky coal
SITE A
PROBE LOCATION RLR OUT

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
1		.09	.45	954.77	660	295	310		90	130		4.0
2	14:35	.24	1.20	956.02	665	300	310		88	128		7.8
3		.19	.95	957.17	680	330	310		80	130		6.3
4		.21	1.05	958.37	670	330	320		78	130		7.0
5		.08	.40	954.12	670	285	320		88	130		3.7
6		.24	1.20	960.39	680	275	320		80	130		7.8
7	14:50	.22	1.10	961.61	680	295	310		75	130		7.2
8		.12	.60	962.51	665	300	315		75	132		4.5
9		.07	.15	963.00	660	260	305		90	132		2.5
10	15:02	.18	.90	964.10	680	270	305		85	133		6.2
11		.21	1.05	965.29	760	305	305		72	133		7.0
12		.13	.65	966.23	685	325	305		70	133		4.8
13	15:13	.03	.15	966.74	680	270	315		80	136		2.5
14		.18	.90	967.88	710	300	290		76	135		6.8
15		.16	.80	968.89	730	330	300		70	138		5.3
16		.14	.70	969.89	710	340	300		68	135		5.0
17		.08	.40	970.64	680	315	300		78	140		3.7
18		.22	1.10	971.84	640	310	300		75	140		7.2
19		.19	.95	972.96	710	295	310		72	140		6.2
20		.12	.60	973.87	690	340	305		70	140		4.5
21	15:40	.07	.35	974.56	670	315	300		80	142		3.5
22		.22	1.10	975.73	680	315	300		75	142		7.2
23		.16	.80	976.76	700	315	300		70	142		5.8
24		.21	1.05	977.885	700	340	300		70	142		7.0
Average		.1550	.7750		685							

METER VOL. END 977.885
START 953.450
SAMPLE VOL. 23.435 ft^3/ac

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	23.74	23.80

Percent O_2 =

Corr. Vol. = 26.0556

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Nor(Ideal)=
% H_2O = Nor(Actual)=.362
= .37

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	135	100	35
#2	102	100	2
#3	0	0	0
		Total	37

#4	g(End)	g(Start)	Δgrams
Silica Gel	170.4	163.4	70
		Total Vol. H_2O	44 ml

PARTICULATE

DATA

Load dropped from 85-760% after 8 points. Sampling continued for ash sample only.

Sampling Time Per Point, Min
3.5

Before
After

Leak Check Rate
Vac in. Hg ft³/min

ISOKINETICS = _____ %

TEST NUMBER 33
DATE 10/16/77
OPERATOR PLL + RAP
FUEL Kemmerer
SITE A
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
1	11:13	.09	.47	979	660	265	320		82	118		3.8
2		.24	1.25	983.00	670	335	320		62	118		7.4
3		.17	.88	985.70	670	285	365		62	119		6.8
4	11:30	.21	1.10	988.60	670	355	320		64	120		7.0
5	11:23	.03	.157	989.7	640	325	302		73	123		2.3
6		.22	1.15	992.6	670	333	310		70	125		7.0
7		.22	1.15	995.5	685	365	311		67	128		7.0
8		.13	.675	997.7	665	365	322		70	130		4.8
Port 4												
	15min.	.21	1.10	1009.6	670	303	335		88	138		7.0
Port 3												
	20min	.21	1.10	1025.5	670	330	320		80	143		7.0
Port 2												
	14:43	.13	.18	1034.6								
Port 2		.11	1.6	1067.80	615	310	330		72	155		10.0
1/3 inch nozzle max setting												
Average												

METER VOL. END 1061.96
START 978.008
SAMPLE VOL. _____ ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.827		

Percent O_2 = _____

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal) =
% H_2O = Noz(Actual) =
=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	_____	-	_____	=	_____
#2	_____	-	_____	=	_____
#3	_____	-	_____	=	_____
				Total	_____
#4	g(End)		g(Start)		Δgrams
Silica Gel	_____	-	_____	=	_____

Total Vol. H_2O _____ ml

PARTICULATE

DATA

Sampling Time Per Point, Min
3.0

Leak Check Rate

	Vac in. Hg	ft³/min
Before	15"	0.00
After	15"	0.00

ISOKINETICS = 96 %

TEST NUMBER 34A
DATE 10/29/77
OPERATOR JEC
FUEL Co-solidation Coal
SITE A
PROBE LOCATION RED OAK

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.06	.31	1087.25	600	280	350		100	125		2
2		.15	.75	1088.74	600	320	350		90	125		4
3		.14	.70	1090.71	640	350	345		80	125		5
4		.07	.35	1092.65	620	350	345		90	130		2
5	12:08	.04	.20	1093.94	600	300	340		100	130		1.5
6		.16	.80	1095.11	620	330	340		90	130		5
7		.15	.75	1097.12	610	350	345		90	133		5
8		.10	.51	1099.08	600	350	340		85	135		4.5
9		.10	.51	1100.71	620	300	330		100	135		4.5
10		.17	.85	1102.30	640	320	300		95	140		6.5
11		.14	.70	1104.10	640	350	300		90	140		6
12		.15	.75	1106.17	620	350	300		95	140		6
13		.08	.40	1108.10	600	280	330		100	130		4.5
14		.16	.80	1109.57	620	300	330		100	130		
15		.13	.66	1111.68	630	350	330		85	130		6.5
16		.14	.70	1113.52	600	350	330		85	130		7.0
17		.14	.70	1115.45	620	300	330		90	125		7.0
18		.17	.90	1117.35	600	330	320		80	120		7.5
19		.15	.75	1119.74	610	320	320		80	120		7.0
20		.18	.90	1121.85	600	330	320		70	120		P.O
21		.05	.25	1124.05	600	300	330		85	120		3
22		.20	1.0	1125.23	620	330	320		80	125		9
23		.19	.95	1127.25	640	360	330		80	125		9
24		.15	.75	1130.15	620	360	350		80	125		7.5
			Final	1132.17								
Average		.132	.664		615							

METER VOL. END 1132.17
START 1087.25
SAMPLE VOL. 44.92 ft³ DNC

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	23.64	23.69

Percent O_2 =

Corr. vol. = 48.90 ft³

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = 15 Noz(Actual)= .381
Ψ = 370

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	170	- 100	= 70
#2	50	- 100	= -50
#3	10	- 0	= 10
		Total	30

#4 Silica Gel	g(End)	g(Start)	Δgrams
	166	- 150	= 16
		Total Vol. H_2O	46 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5

Leak Check Rate

	Vac in. Hg	ft^3/min
Before	15.0	.002
After		

ISOKINETICS = 106 %

TEST NUMBER 348
DATE 10/29/77
OPERATOR RAP
FUEL Consolidation
SITE A
PROBE LOCATION ESP OUT

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
1	11:27	.52	.135	1801.52	345	340	310		68	Temp		<20
2		.69	.18	1803.31	350	320	310		62	Comp.		<2.0
3		.94	.245	1805.39	350	300	310		60	530°R		<2.0
4		1.20	.31	1807.77	350	290	310		60			2.2
5		1.10	.29	1809.90	350	305	305		59			2.0
6		.91	.24	1811.91	350	310	305		60			<2.0
		TEMPORARY SHUTDOWN TO ALLOW SASS START UP										
7	13:14	1.05	.28	1814.20	350	320	290		60			2.2
8		1.28	.34	1816.77	355	320	290		58			2.5
9		1.55	.41	1819.54	350	290	290		57			2.8
10		1.95	.52	1822.69	355	290	295		53			3.2
11		1.75	.46	1825.57	355	290	290		48			3.0
12		1.40	.37	1828.16	355	275	290		45			2.7
13	14:31	1.55	.41	1831.08	350	320	320		50			2.8
14		1.75	.46	1134.06	350	315	315		48			3.0
15		2.05	.54	1837.31	350	290	315		48			3.5
16		2.25	.62	1840.71	350	300	315		48			3.8
17		1.80	.47	1843.62	355	300	320		48			3.0
18		1.75	.46	1846.49	355	300	320		45			2.8
19		2.25	.62	1848.81	360	300	310		58			3.8
20		2.80	.74	1853.52	360	320	320		52			4.2
21		3.0	.80	1857.39	360	310	320		50			4.5
22		2.7	.72	1861.08	365	290	290		50			4.0
23		2.1	.56	1864.31	370	290	310		53			3.5
24	15:50	1.85	.49	1867.260	365	295	300		53			3.2
Average		1.674	.444		354							

METER VOL. END 1867.260
START 1799.795
SAMPLE VOL 67.465 ft^3 unc.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.666	24.07	23.69

Percent O_2 =

Corr. Vol = 70.568 ft^3

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal) =
ΔH_2O = Noz(Actual) = .188
T = 7.0

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	175	100	75
#2	110	100	10
#3	0	0	0
		Total	85

	g(End)	g(Start)	Δgrams
#4 Silica Gel	162.0	150.0	12
		Total Vol. H_2O	97 ml

PARTICULATE

DATA

Sampling Time Per Point, Min

Leak Check Rate

	Vac in. Hg	ft³/min
Before	16	0.00
After	16	0.03

ISOKINETICS = 100 %

TEST NUMBER 35A
DATE 10/30/77
OPERATOR JEC
FUEL Consolidation Coal
SITE A
PROBE LOCATION BLROUT

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
1		.02	.10	1132.91	620	270	350		85	100		.1
2		.21	1.1	1133.80	650	320	350		75	105		6
3		.19	.95	1136.21	610	360	350		70	105		6
4		.13	.65	1138.67	650	380	350		70	110		4.5
5		.03	.15	1140.57	620	310	340		80	110		1
6		.22	1.1	1141.59	640	300	330		75	110		7
7		.20	1.0	1144.05	660	350	330		70	110		6
8		.16	.80	1146.45	640	340	330		70	110		—
9		.08	.40	1149.54	640	280	330		75	115		2.5
10		.21	1.1	1150.2	650	290	330		70	115		6.5
11		.17	.85	1152.42	650	330	330		70	115		5
12		.18	.90	1154.60	610	330	330		75	115		6
13		.14	.71	1156.81	620	280	300		70	110		5
14		.20	1.0	1158.97	640	300	330		65	110		6.2
15		.17	.85	1161.5	650	340	330		60	110		5.5
16		.19	.95	1163.52	630	320	330		70	115		—
—				1165.832		Leak	Check	-	OK			
17		.13	.65	1167.19	650	260	310		90	110		—
18		.17	.86	1169.18	660	300	320		80	110		6.0
19		.16	.80	1171.33	660	330	330		75	115		5.0
20		.10	.51	1173.47	610	340	330		80	115		3.0
21		.03	.16	1175.20	620	260	330		90	115		1.0
22		.15	.26	1176.12	660	330	340		70	120		5
23		.18	.90	1178.41	660	340	340		70	120		—
24		.14	.70	1180.64	660	340	340		70	120		5
Average		.148	.748	1182.600	643							

METER VOL. END 1192.60
START 1132.91
SAMPLE VOL. 44.69 ft³ Vac

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	23.57	23.62

Percent O_2 =

Corr. Vol. = 52.66 ft³

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= .381
Y = .37

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	120	-	100	=	20
#2	125	-	100	=	25
#3	22	-	0	=	22
				Total	67

#4	g(End)		g(Start)		Δgrams
Silica Gel	151.5	-	150.7	=	1.5

Total Vol. H_2O 68.5 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min	Before	After
5		

ISOKINETICS = 105%

TEST NUMBER 35B
DATE 10/30/77
OPERATOR RAP
FUEL Consolidation
SITE 4
PROBE LOCATION S&P out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	13:01	.78	.20	1869.66	360	310	310		45	TEMP		<2.0
2		1.20	.31	1872.17	365	300	290		45	COMP		2.2
3		1.65	.42	1875.06	365	310	290		42	530°R		2.1
4		1.80	.46	1877.06	365	290	300		42			2.1
5		1.70	.43	1880.91	370	290	310		42			2.7
6		1.05	.27	1883.16	365	290	320		42			2.2
7	13:51	1.25	.32	1885.66	365	305	310		52			2.3
8		1.80	.46	1888.57	365	320	290		50			2.7
9		2.30	.58	1891.52	370	320	300		48			3.1
10		2.65	.67	1895.30	370	300	300		45			3.7
11		2.40	.62	1898.59	365	295	310		45			3.4
12		1.65	.42	1901.33	365	295	310		43			2.3
13	14:38	1.65	.42	1904.12	370	285	320		48			2.7
14		1.85	.47	1907.00	365	320	300		47			2.9
15		2.30	.59	1910.25	370	320	320		45			3.3
16		2.70	.69	1913.71	370	310	320		45			3.7
17		1.95	.50	1916.68	370	305	320		43			2.9
18		1.70	.43	1919.46	370	290	315		45			2.3
19		2.30	.59	1922.58	370	310	285		48			3.2
20		2.6	.66	1926.50	370	310	285		48			3.8
21		3.20	.82	1930.09	370	270	290		37			4.3
22		3.70	.95	1934.33	370	300	300		42			5.0
23		3.55	.90	1938.46	370	310	310		42			4.8
24		3.0	.76	1942.262	370	310	310		42			4.3
Average		2.11	.539		367.7							

METER VOL. END 1942.262
START 1862.872
SAMPLE VOL 74.65 ft^3 unc.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.666	24.11	23.63

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal)=
% H_2O = Noz(Actual)=.188

T -7.2

Corr. Vol = 78.115 ft^3 mtg

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	180	100	80
#2	112	100	12
#3	.5	0	.5
		Total	92.5

#4 Silica Gel	g(End)	g(Start)	Δgrams
	164	150	14

Total Vol. H_2O 1065 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
1.5

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After	15.0	0.00

ISOKINETICS = 103 %

TEST NUMBER 26
DATE 11/1/77
OPERATOR RAP
FUEL Consolidation Coal
SITE A
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
1	10:18	.12	.59	1184.70	620	280	300		82	110		46
2		.15	.74	1185.75	620	290	300		82	110		5.1
3		.10	.49	1186.60	630	320	305		71	110		3.8
4		.12	.59	1187.51	625	320	310		78	112		4.3
5		.10	.49	1188.37	630	290	310		80	118		4.0
6		.13	.64	1189.32	640	280	310		72	118		4.7
7		.11	.54	1190.20	645	320	320		70	118		4.1
8		.11	.54	1190.95	640	330	250		80	120		4.1
9	10:59	.02	.10	1191.36	620	280	280		92	125		2.0
10		.14	.69	1192.33	620	300	280		82	125		4.9
11		.14	.69	1193.32	640	320	320		72	124		5.1
12		.12	.59	1194.24	640	320	320		72	128		4.7
13		.02	.105	1194.69	630	310	320		85	130		2.3
14		.16	.82	1195.74	630	300	310		95	130		6.5
15	12:01	.15	.75	1196.77	655	285	300		95	130		6.7
16		.08	.40	1197.52	640	300	300		78	130		4.3
		—	—	———	—	—	—		—	—		
17		.14	.70	1198.50	640	290	300		88	130		6.0
18		.16	.80	1199.55	640	300	300		85	130		6.5
19	2min	.15	.75	1200.90	645	320	310		72	128		6.3
20		.08	.40	1201.65	640	220	305		70	130		4.3
21	12:34	.05	.25	1202.20	630	300	300		88	130		4.3
22		.16	.80	1203.30	640	310	310		80	130		7.0
23		.13	.65	1204.25	650	320	310		74	130		6.0
24		.12	.60	1205.32	650	320	310		73	131		5.5
Average		.115	.57		635.8							

METER VOL. END 1205.132
START 1193.718
SAMPLE VOL = 21.414 ft^3 corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	23.78	23.82

Percent O_2 =

Corr. Vol. 23.311 ft^3

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= .581
P = .57

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	128	100	28
#2	105	100	5
#3	0	0	0
		Total	33

	g(End)	g(Start)	Δgrams
#4 Silica Gel	1550	150.0	5
		Total Vol. H_2O	38 ml

78

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min
1.5

Before

After

ISOKINETICS = 99 %

TEST NUMBER 37

DATE 9-1-77

OPERATOR RAP + JEC

FUEL Consolidation Coal

SITE A

PROBE LOCATION RLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	15:59	.08	.39	1211.30	640	290	275	?	105	130		3.2
2		.17	.84	1212.39	650	320	280		95	130		6.0
3		.12	.59	1213.28	660	320	290		90	130		4.5
4		.11	.54	1214.14	660	330	290		88	130		4.2
5		.02	.10	1214.54	640	320	320		90	130		2.0
6		.17	.84	1215.62	645	300	310		90	130		6.2
7		.15	.74	1216.63	660	320	315		82	130		5.4
8		.09	.44	1217.40	670	330	330		80	130		4.0
9		.02	.10	1217.80	645	320	300		84	132		—
10		.18	.89	1218.89	650	290	310		88	133		6.5
11		.18	.89	1219.95	670	300	320		80	135		6.6
12		.11	.54	1220.82	680	330	315		70	135		4.5
13	16:31	.05	.25	1221.40	630	290	300		80	135		—
14		.18	.89	1222.48	650	290	310		80	136		6.7
15		.17	.84	1223.54	650	280	310		75	138		6.3
16		.13	.64	1224.46	650	310	310		72	139		5.0
17		.16	.79	1225.50	—	300	320		80	140		5.3
18	2min	.18	.89	1226.93	—	310	320		75	140		6.3
19		.15	.74	1227.91	—	310	320		72	140		5.6
20		.08	.39	1228.63	—	310	320		72	141		3.7
21		.10	.49	1229.41	—	310	320		88	142		4.2
22		.17	.84	1230.46	—	290	315		82	142		6.3
23		.12	.59	1231.35	—	300	315		79	142		4.8
24		.13	.64	1232.258	—	300	310		79	142		5.1
Average												

METER VOL. END 1232.258

START 210.544

SAMPLE VOL. 21.714 ft^3 Dnc

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.83)	23.60	23.64

Percent O_2 =

Corr. Vol = 23.638 ft^3

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Nox(Ideal) =

% H_2O = Nox(Actual) = j #1

▼ = .37

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	128	- 100	= 28
#2	105	- 100	= 5
#3	0	- 0	= 0
		Total	33

	g(End)	g(Start)	Δgrams
#4 Silica Gel	1680	- 1570	= 10
		Total Vol. H_2O	43 ml

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft³/min
Before	15	0.02
After		

ISOKINETICS = 100 %

TEST NUMBER 38
DATE 11/22/77
OPERATOR RAP + JEC
FUEL Consolidation Coal
SITE A
PROBE LOCATION BLR 05

* Nomograph Change

Sampling Time Per Point, Min
1.5

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1	11:12	.06	.30	1233.05	560	300	320	5	100	120		3.0
2		.08	.40	1233.84	600	310	320		92	120		3.5
3		.08	.40	1234.61	600	325	325		85	120		3.5
4		.07	.35	1235.32	570	325	325		83	122		3.2
5		.07	.35	1236.04	580	320	320		82	123		3.2
6		.09	.45	1236.85	600	300	315		80	124		3.6
7		.07	.35	1237.56	610	310	315		75	125		3.2
8		.04	.20	1237.11	570	320	320		75	125		2.5
9		.01	.05	1238.41	585	290	325		105	130		<2.0
10		.07	.35	1239.12	590	290	320		90	130	*.36	3.2
11		.07	.36	1239.86	590	310	320		80	132		3.2
12		.05	.26	1240.47	590	315	315		74	132		2.8
13	11:52	.01	.05	1240.78	565	300	305		82	132		<2.0
14		.09	.47	1241.58	585	290	310		82	132		4.0
15		.10	.52	1242.43	590	310	310		75	135		4.2
16		.05	.26	1243.02	560	325	330		70	133	*.35	2.8
17		.09	.48	1243.84	545	315	320		80	138		3.8
18		.10	.54	1244.72	585	320	325		72	138		4.3
19		.08	.43	1245.46	595	320	315		72	138		3.6
20		.05	.265	1246.06	—	320	315		72	139		2.8
21		.07	.37	1246.78	520	320	310		82	140		3.3
22		.10	.54	1247.64	580	310	310		80	140		—
23		.08	.43	1248.39	590	315	310		73	140		3.6
24		.07	.37	1249.082	570	315	315		72	142		3.3
Average		.0638	.3525		582							

METER VOL. END 1249.082
START 1232.33
SAMPLE VOL 16.69 ft³ corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	23.68	23.71

Percent O_2 =

Corr. Vol. = 18.179 ft³

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Nox(Ideal) =
% H_2O = Nox(Actual) = .38
Y = .3

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	121	100	21
#2	101	100	1
#3	0	0	0
		Total	22

	g(End)	g(Start)	Δgrams
#4 Silica Gel	154.3	150	4.3

Total Vol. H_2O 263 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
1.5

Leak Check Rate

	Vac in. Hg	ft³/min
Before	12.0	0.01
After		

ISOKINETICS = 101 %

TEST NUMBER 39
DATE 11/2/77
OPERATOR RAP
FUEL Combustion
SITE A
PROBE LOCATION BLR. OUT.

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.05	.265	1250.27	565	300	315		112	130		2.7
2		.09	.47	1251.10	570	310	310		100	130		3.6
3	16:52	.01	.31	1251.83	580	320	300		90	130		3.0
4	16:52	.08	.43	1252.62	560	320	310		82	130		3.2
5		.07	.37	1253.33	550	290	320		90	135		3.0
6		.09	.47	1254.14	560	320	295		79	135		3.6
7		.09	.47	1254.95	570	320	295		79	135		3.6
8		.04	.21	1255.51	570	320	295		78	135		2.4
9		.01	.05	1255.79	560	310	295		92	138		<2.0
10		.08	.43	1256.58	580	300	275		92	139		3.2
11		.08	.43	1257.34	585	320	280		80	138		3.5
12		.06	.32	1258.01	585	320	280		80	140		3.0
13		.01	.05	1258.30	565	300	295		92	142		<2.0
14		.06	.32	1258.98	570	290	290		92	142		3.0
15		.07	.37	1259.71	585	310	295		85	142		3.2
16		.07	.37	1260.40	570	320	290		83	142		3.2
17		.09	.47	1261.19	570	260	290		112	145		3.5
18		.09	.48	1262.00	585	275	290		92	145		3.7
19		.08	.43	1262.77	580	290	290		85	145		3.5
20		.04	.21	1263.30	570	290	290		85	145		2.5
21		.07	.37	1264.01	570	290	290		95	145		3.2
22		.08	.43	1264.78	580	290	300		88	145		—
23		.06	.32	1265.44	585	310	290		83	145		3.1
24		.06	.32	1266.100	570	310	290		83	145		3.1
Average												

METER VOL. END 1266.100
START 1249.640
SAMPLE VOL. 16.46 ft³/sec.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	23.68	23.71

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= .381
Y = .355

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	125	- 100	= 25
#2	1025	- 100	= 2.5
#3	0	- 0	= 0
		Total	27.5

#4 Silica Gel	g(End)	g(Start)	Δgrams
	154.5	- 150.0	= 4.5

Total Vol. H_2O 32 ml

Corr. Vol. = 17.918 ft³

PARTICULATE LAB WORKSHEET

TEST NO. 3 (Mech. Out ~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 8/11/77 Box No. _____ Eng. RAP + JEC

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.					3		
BEAKER NO.			1	2			
DATE WT.			8/12/77	8/12/77	8/9/77		
TARE WT.	1		69.5947	51.8184	.7459		
	2		69.5943	51.8185	.7458		
	3		69.5949	51.8184	.7456		
	4						
AVG.			69.5946	51.8184	.7458		

POST TEST WTS.

	1		69.7627	52.1981	.8819		
	2		69.7627	52.1984	.8823		
	3		69.7627	52.1984	.8819		
	4						
AVG.			69.7627	52.1983	.8820		
Δ WT.			.1681	.3799	.1362		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 684.2 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 4 (mech OUT ~~Inlet, Outlet~~) LOCATION ABMA - Site A

Date 8/17/77 Box No. _____ Eng. RAP

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.					4		
BEAKER NO.			3	4	—		
DATE WT.			8/19/77	8/19/77	8/12/77		
TARE WT.	1		69.0368	64.3992	.2579		
	2		69.0366	64.3994	.7576		
	3		69.0367	64.3994	.7576		
	4						
AVG.			69.0367	64.3993	.7577		
POST TEST WTS.							
	1		69.1869	64.7910	.8672		
	2		69.1870	64.7911	.8645		
	3		69.1869	64.7913	.8654		
	4				.8648		
AVG.			69.1869	64.7911	.8649		
Δ WT.			.1502	.3918	.1072		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 649.2 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 5 (~~[illegible]~~ mech. OUT.) LOCATION ABMA-SITE A

Date 8/18/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.					1		
BEAKER NO.			5	6	—		
DATE WT.			8/19/77	8/19/77	8/18/77		
TARE WT.	1		64.0685	69.0612	.7518		
	2		64.0687	69.0614	.7516		
	3		64.0685	69.0614	.7516		
	4						
AVG.			64.0686	69.0613	.7517		

POST TEST WTS.

	1		64.2877	69.4748	.9872		
	2		64.2878	69.4749	.9872		
	3		64.2877	69.4752	.9873		
	4				—		
AVG.			64.2877	69.4749	.9872		
Δ WT.			.2191	.4136	.2335		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 866.2 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 6 (Mech. OUT ~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 8/18/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.					2	
BEAKER NO.			8	7	—	
DATE WT.			8/19/77	8/19/77	8/19/77	
TARE WT.	1		64.1195	50.3093	.7495	
	2		64.1200	50.3092	.7494	
	3		64.1200	50.3097	.7497	
	4					
AVG.			64.1197	50.3096	.7495	

POST TEST WTS.

	1		64.4392	50.9283	1.0276	
	2		64.4395	50.9284	1.0266	
	3		64.4396	50.9288	1.0264	
	4					
AVG.			64.4394	50.9285	1.0269	
Δ WT.			.3197	.6185	.2774	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 1216.0 mgm REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 10 (mech. OUT) LOCATION ABMA - SITE A

Date 8/24/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	6	
BEAKER NO.			10	9	—	
DATE WT.			8/25/77	8/25/77	—	
TARE WT.	1		69.5976	64.0683	.7553	
	2		69.5976	64.0682	.7554	
	3		69.5978	64.0680	.7554	
	4		—	—	—	
AVG.			69.5976	64.0681	.7554	

POST TEST WTS.

	1		69.7912	64.3051	.8571
	2		69.7724	64.3051	Extremely
	3			64.3052	Hygroscopic
	4		69.7496	—	
AVG.				64.3051	.8571
Δ WT.				0.2370	.1017

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn _____ mgm REMARKS: _____

8830-5 rr

PARTICULATE LAB WORKSHEET

TEST NO. 14 (Mech. OUT ~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 8/26/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			11	—	7		
DATE WT.			8/29/77	—	—		
TARE WT.	1		69.0363	—	.7620		
	2		69.0364	—	.7619		
	3		69.0364	—	.7620		
	4		—	—	—		
AVG.			69.0364	—	.7620		

POST TEST WTS.

	1		69.6576	—	.9307		
	2		69.6579	—	.9638		
	3		69.6580	—	.9638		
	4		—	—	—		
AVG.			69.6578	—	.9638		
Δ WT.			.6214	—	.2018		

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 823.2 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 15 (Mech. OST ~~Inlet, Outlet~~) LOCATION ABMA - Site A

Date 8/22/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	8		
BEAKER NO.			12	13	—		
DATE WT.			8/29/77	8/29/77	—		
TARE WT.	1		64.1199	51.8218	.7649		
	2		64.1200	51.8220	.7649		
	3		64.1201	51.8220	.7648		
	4		—	—	—		
AVG.			64.1200	51.8219	.7649		

POST TEST WTS.

	1		64.3580	52.1146	.9504		
	2		64.3581	52.1146	.9507		
	3		64.3582	52.1147	.9507		
	4		—	—	—		
AVG.			64.3581	52.1146	.9506		
Δ WT.			.2381	.2927	.1857		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 716.5 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 16A (Mech. OUT ~~(Inlet, Outlet)~~) LOCATION ABMA - SITE A

Date 8/30/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			1	—	—	
BEAKER NO.			17	16	9	
DATE WT.			9/1/77	9/1/77	—	
TARE WT.	1		64.3992	50.3097	.7520	
	2		64.3986	50.3093	.7518	
	3		64.3989	50.3095	.7517	
	4		—	—	—	
AVG.			64.3989	50.3095	.7518	
POST TEST WTS.						
	1		64.6006	50.4938	.8841	
	2		64.6002	50.4936	.8842	
	3		64.6000	50.4937	.8846	
	4		—	—	—	
AVG.			64.6003	50.4937	.8843	
Δ WT.			.2014	.1842	.1325	

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 518.1 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 16B (ESP OUT) (~~Inlet, Outlet~~) LOCATION ABMA - Site A

Date 8/30/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			2		—	
BEAKER NO.			18		10	
DATE WT.			9-1-77		—	
TARE WT.	1		69.0615		.7537	
	2		69.0608		.7537	
	3		69.0610		.7537	
	4		—		—	
AVG.			69.0611		.7537	

POST TEST WTS.

	1		69.0715		.7814	
	2		69.0716		.7810	
	3		69.0714		.7813	
	4		—			
AVG.			69.0715		.7812	
Δ WT.			.0104		.0275	

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 37.9 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 174 (ESP OUT ~~(Inlet, Outlet)~~) LOCATION ABMA - SITE A

Date 8/31/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			3		—	
BEAKER NO.			15		11	
DATE WT.			9-1-77			
TARE WT.	1		64.0682		.7499	
	2		64.0681		.7498	
	3		64.0675		.7498	
	4		—		—	
AVG.			64.0679		.7498	

POST TEST WTS.

	1		64.0795		.7647	
	2		64.0791		.7649	
	3		64.0791		.7650	
	4		—		—	
AVG.			64.0792		.7649	
Δ WT.			.0113		.0151	

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 26.4 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 17B STACK LOCATION ABMA - SITE A

Date 8/31/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			4		—	
BEAKER NO.			14		5	
DATE WT.			9/1/77			
TARE WT.	1		69.0366		.7540	
	2		69.0360		.7537	
	3		69.0361		.7538	
	4		—		—	
AVG.			69.0362		.7538	

POST TEST WTS.

	1		69.0474		.7661	
	2		69.0469		.7661	
	3		69.0468		.7656	
	4				—	
AVG.			69.0470		.7659	
Δ WT.			.0108		.0121	

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 22.9 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 21 (DUPOUT ~~Inlet, Outlet~~) LOCATION ABMA SITE A

Date 9/23/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			21	19	14	
DATE WT.			9/25/77	9/25/77	9/10/77	
TARE WT.	1		64.1198	64.3976	.7584	
	2		64.1200	64.3976	.7584	
	3		64.1199	64.3975	.2584	
	4		—	—	—	
AVG.			64.1199	64.3976	.7584	

POST TEST WTS.

1		64.3764	73.9676	.8944	
2		64.3762	73.9681	.8946	
3		64.3765	73.9678	.8946	
4		—	—	—	
AVG.		64.3764	73.9678	.8945	
Δ WT.		.2565	9.5702	.1361	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 9962.8 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 22 (BLR OUT ~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 9/23/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			26	20	15	
DATE WT.			9/25/77	9/25/77	9/10/77	
TARE WT.	1		64.0683	50.3089	.7557	
	2		64.0683	50.3091	.7557	
	3		64.0681	50.3090	.7557	
	4		—	—	—	
AVG.			64.0682	50.3090	.7557	

POST TEST WTS.

	1		64.2755	65.6109	1.0070
	2		64.2752	65.6112	1.0072
	3		64.2753	65.6113	1.0072
	4		—	—	—
AVG.			64.2753	65.6111	1.0071
Δ WT.			.2071	15.3021	.2514

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 15,760.6 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 23 (BLKOUT ~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 9/24/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.						
BEAKER NO.			23	22	16	
DATE WT.			9/25/77	9/25/77	9/10/77	
TARE WT.	1		69.5973	51.8214	.7576	
	2		69.5973	51.8217	.7574	
	3		69.5972	51.8218	.7574	
	4		—	—	—	
AVG.			69.5973	51.8216	.7575	

POST TEST WTS.

	1		69.7124	57.5637	.8622	
	2		69.7123	57.5641	.8617	
	3		69.7124	57.5638	.8620	
	4		—	—	—	
AVG.			69.7123	57.5639	.8620	
Δ WT.			.1150	5.7423	.1045	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 5961.8 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 24 (BLR OUT ~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 9/24/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.						
BEAKER NO.			24	25	17	
DATE WT.			9/25/77	9/25/77	9/10/77	
TARE WT.	1		69.0357	69.0611	.7431	
	2		69.0356	69.0608	.7429	
	3		69.0358	69.0611	.7429	
	4		—	—	—	
AVG.			69.0357	69.0610	.7430	

POST TEST WTS.

	1		69.1762	73.5375	.8449	
	2		69.1767	73.5375	.8447	
	3		69.1765	73.5376	.8447	
	4		—	—	—	
AVG.			69.1765	73.5375	.8448	
Δ WT.			.1408	4.4765	.1018	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 4719.1 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 26A (Boiler Outlet) (~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 10/1/77 Box No. _____ Eng. _____

Test Description BLR OUT

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.							
BEAKER NO.			21	20	18		
DATE WT.			10-11-77	10/11/77	—		
TARE WT.	1		64.1201	50.3095	.7709		
	2		64.1199	50.3094	.7708		
	3		64.1197	50.3095	.7708		
	4		—	—			
AVG.			64.1199	50.3095	.7708		

POST TEST WTS.

	1		64.2592	56.4736	.8603		
	2		64.2601	extremely	.8601		
	3		—	Hygroscopic.	.8603		
	4		—				
AVG.			64.2596	56.4736	.8603		
Δ WT.			0.1398	6.1641	.0894		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 6393.7 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 26B (Mech. OUT ~~Inlet, Outlet~~) LOCATION ABMA SITE A

Date 10/11/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.							
BEAKER NO.			16	22	19		
DATE WT.			10/11/77	10/11/77	10/10/77		
TARE WT.	1		69.5970	51.8218	.7763		
	2		69.5973	51.8218	.7762		
	3		69.5972	51.8217	.7762		
	4						
AVG.			69.5972	51.8218	.7762		

POST TEST WTS.

	1		69.7721	52.2484	1.0144	
	2		69.7726	52.2488	1.0145	
	3		—	—	1.0147	
	4		—	—		
AVG.			69.7724	52.2486	1.0145	
Δ WT.			0.1752	0.4269	0.2383	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 840.3 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 28 Boiler Outlet (~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 10/11/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.						
BEAKER NO.			17	23	21	
DATE WT.			10/11/77	10/11/77		
TARE WT.	1		69.0598	69.0355	.7581	
	2		69.0600	69.0355	.7581	
	3		69.0603	—	.7582	
	4		—	—	—	
AVG.			69.0601	69.0355	.7581	

POST TEST WTS.

	1		69.3755	84.8521	.8892
	2		69.3759	84.8526	.8896
	3		—	—	.8898
	4		—	—	—
AVG.			69.3757	84.8524	.8895
Δ WT.			0.3156	15.8168	.1314

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 16,263.9 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 29 (BLR OUT ~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 10/11/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.						
BEAKER NO.			19	26	22	
DATE WT.			10/11/77	10/11/77	10/10/77	
TARE WT.	1		64.3976	64.0673	.7583	
	2		64.3978	64.0672	.7583	
	3		64.3975	64.0671	.7583	
	4		—	—		
AVG.			64.3977	64.0672	.7583	

POST TEST WTS.

	1		64.6192	75.8618	.8915
	2		64.6196	75.8630	.8917
	3		—	HIGROSCOPIC	.8914
	4		—	—	—
AVG.			64.6194	75.8624	.8917
Δ WT.			0.2217	11.7952	0.1334

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 12,150.? mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 34A (BLR OUT ~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 10/27/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.					18		
BEAKER NO.			17	37		21	
DATE WT.			—	—	10/26/77	—	
TARE WT.	1		69.0615	49.6490	.7414	64.1202	
	2		69.0613	49.6488	.7416	64.1205	
	3		69.0612	49.6488	.7412	64.1201	
	4		—	—	—	—	
AVG.			69.0613	49.6489	.7414	64.1202	
POST TEST WTS.							
	1		69.3196	64.6347	.8340	64.1251	
	2		69.3199	64.6350	.8341	64.1265	
	3		69.3199	64.6349	.8340	64.1268	
	4		—	—	—		
AVG.			69.3198	64.6349	.8340	64.1263	
Δ WT.			.2585	14.9860	.0926	.0061	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 15,337.1 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 34 B ESP OUT (~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 10/27/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.					19		
BEAKER NO.			#23		—		
DATE WT.					10-/26/77		
TARE WT.	1		69.0361		.7562		
	2		69.0363		.7565		
	3		69.0361		.7560		
	4		—		—		
AVG.			69.0362		.7562		

POST TEST WTS.

	1		69.0664		.8283		
	2		69.0666		.8283		
	3		69.0670		.8283		
	4		—		—		
AVG.			69.0667		.8283		
Δ WT.			.0305		.0721		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 102.6 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 35A (~~Inlet, Outlet~~ DLR OUT) LOCATION ABMA SITE - A

Date 10/30/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.							
BEAKER NO.			16	28	21		
DATE WT.							
TARE WT.	1		69.5974	50.4534	.7530		
	2		69.5973	50.4538	.7530		
	3		69.5973	50.4533	.7529		
	4						
AVG.			69.5973	50.4535	.7530		

POST TEST WTS.

	1		69.8518	78.0646	1.0591		
	2		69.8521	78.0657	1.0590		
	3		69.8520	78.0660	1.0589		
	4						
AVG.			69.8520	78.0654	1.0590		
Δ WT.			.2550	27.6119	.3060		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 28,172.9 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 35B (ESP OUT ~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 10/30/71 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.						
BEAKER NO.			19		22	
DATE WT.						
TARE WT.	1		64.3982		.7494	
	2		64.3985		.7493	
	3		64.3984		.7491	
	4					
AVG.			64.3984		.7493	

POST TEST WTS.

	1		64.4177		.7984
	2		64.4181		.7885
	3		64.4179		.7884
	4				
AVG.			64.4179		.7884
Δ WT.			.0195		.0391

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 58.6 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 36 (BLR 005, [redacted]) LOCATION ABMA - SITE A

Date 11/1/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			36		23	
BEAKER NO.			32	31	—	
DATE WT.			11/3/77	—	—	
TARE WT.	1		68.4710	50.3086	.7545	
	2		68.4706	50.3089	.7546	
	3		68.4706	50.3084	.7546	
	4		—	—	—	
AVG.			68.4707	50.3086	.7546	

POST TEST WTS.

	1		68.6525	62.2552	.9466	
	2		68.6528	62.2555	.9466	
	3		68.6529	62.2557	.9467	
	4		—	—	—	
AVG.			68.6527	62.2555	.9466	
Δ WT.			.1820	11.9469	.1920	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 12,320.9 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 37 (BLR OUT ~~Inlet, Outlet~~) LOCATION ABMA - SITE A

Date 11/1/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			37		24		
BEAKER NO.			33	22	—		
DATE WT.			11/3/77	—	—		
TARE WT.	1		63.5574	51.8235	.7420		
	2		63.5574	51.8227	.7420		
	3		63.5572	51.8225	.7419		
	4		—	—	—		
AVG.			63.5573	51.8229	.7420		

POST TEST WTS.

	1		63.9039	66.0558	.8968	
	2		63.9040	66.0559	.8966	
	3		63.9042	66.0561	.8966	
	4		—	—	—	
AVG.			63.9040	66.0559	.8967	
Δ WT.			.3467	14.2330	.1547	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 14,734.4 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 38 (BLR OUT) LOCATION ABMA - SITE

Date 11/2/77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.					25	
BEAKER NO.			36	37	—	
DATE WT.			11/3/77	11/3/77	—	
TARE WT.	1		64.1640	64.4221	.7335	
	2		64.1640	64.4220	.7334	
	3		64.1639	64.4221	.7333	
	4		—	—	—	
AVG.			64.1640	64.4221	.7334	

POST TEST WTS.

	1		64.4567	67.3119	.7972
	2		64.4570	67.3123	.7969
	3		64.4571	67.3125	.7969
	4		—	—	—
AVG.			64.4569	67.3122	.7970
Δ WT.			.2929	2.8901	.0636

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 3246.6 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 39 DLR OUT (In [redacted]) LOCATION ABMA - SITE A

Date 11/2/77 Box No. _____ Eng. _____

Test Description Min. QFA.

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			39	—	26	
BEAKER NO.			34	35	—	
DATE WT.			11/3/77	11/3/77	—	
TARE WT.	1		64.0685	69.5678	.7368	
	2		64.0683	69.5675	.7365	
	3		64.0682	69.5675	.7365	
	4		—	—	—	
AVG.			64.0683	69.5676	.7366	

POST TEST WTS.

	1		64.3370	75.8657	.8354
	2		64.3373	75.8657	.8352
	3		64.3373	75.8658	.8357
	4		—	—	—
AVG.			64.3372	75.8657	.8353
Δ WT.			.2689	6.2981	.0987

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 6,665.7 mgm REMARKS: _____

8830-5 rev

SECTION 3.0

GASEOUS DATA

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GASEOUS EMISSION SUMMARY

Location: A

Fuel:

TEST NO.	DATE	LOAD %	CONDITIONS	MULTICLONE OUTLET O_2 % Dry	MULTICLONE OUTLET CO_2 % Dry	MULTICLONE OUTLET CO ppm Dry	MULTICLONE OUTLET NO ppm Dry	MULTICLONE OUTLET NO_2 ppm Wet	MULTICLONE OUTLET HC ppm Wet	ECON. OUTLET O_2 % Dry	ECON. OUTLET CO_2 % Dry	ECON. OUTLET CO ppm Dry	ECON. OUTLET NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
1	9 Aug 77	64	As Found	4.9	15.2	180	343			7.8	12.0	167	410	768	2	SO_x Mech. outlet
2A	10 Aug 77	57	As Found	4.3	16.0	86	345			5.6	14.2	175	380			Gaseous only
2B			reduce grate air	3.6	16.8	126	316									
2C			reduce grate air	2.7	17.9	266	285									
2D			reduce grate air	1.7	18.9	1072	256									
2E			raise grate air	3.7	16.8	127	302									
2F			raise grate air	4.4	15.7	174	325									
2G			raise grate air	5.1	14.8	91	358									
2H			raise grate air	5.9	13.6	95	400									
3	11 Aug 77	61	low grate air	4.1	16.9	219	312			5.9	13.9	203	340			Part. Mech. outlet
4A	17 Aug 77	60	high grate air	6.3	13.6	77	497			7.7	11.6	68	515			Part. Mech. outlet
4B				7.0												Brink Mech. outlet
5	18 Aug 77	72	low grate air	4.1	16.4	536	385			6.0	13.9	360	432			Part. Mech. outlet
6	18 Aug 77	70	high grate air	5.8	14.7	392	414			7.7	12.4	270	412			Part. Mech. outlet
7A	19 Aug 77	68		5.2	15.1	171	399									Gaseous only
7B				4.0	16.4	657	365									

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

GASEOUS EMISSION SUMMARY

Location: A

Fuel: _____

TEST NO.	DATE	LOAD %	CONDITIONS	MULTICLONE OUTLET O_2 % Dry	MULTICLONE OUTLET CO_2 % Dry	MULTICLONE OUTLET CO ppm Dry	MULTICLONE OUTLET NO ppm Dry	MULTICLONE OUTLET NO_2 ppm Wet	MULTICLONE OUTLET HC ppm Wet	ECON. OUTLET O_2 % Dry	ECON. OUTLET CO_2 % Dry	ECON. OUTLET CO ppm Dry	ECON. OUTLET NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
7C				3.4	17.1	818	327									
7D				3.0	17.8	1050	326									
7E				5.0	15.4	137	394									
8A	20 Aug 77	65	as Found	4.8	14.9	141	417			6.4	12.9	174	403	749	5	SO_x Mech. outlet
8B		52	as Found	6.8	13.3	53	451			7.8	12.2	168	458	304	0	SO_x at Stack
			STACK EMISSIONS →							8.4	11.5	77	447			
9	23 Aug 77	61	as Found	4.9	15.6	81	367			7.8	12.0	41	383	793	3	SO_x Mech outlet
10	24 Aug 77	37	as Found	9.9	9.5	83	554			10.6	8.4	71	580			Part Mech outlet
11A	24 Aug 77	41	low grate air	7.8	12.7	41	490									Gaseous only
11B			raise grate air	8.0	12.4	56	506									
11C			raise grate air	8.5	11.6	72	541									
11D			raise grate air	9.1	11.2	99	584									
11E			raise grate air	9.5	10.6	102	597									
11F			reduce grate air	7.5	13.0	47	448									
12	24 Aug 77	45	as Found	6.1	14.5	46	414			7.3	13.0	39	380	790	5	SO_x Mech outlet
13A	25 Aug 77	77	as Found	5.2	15.1	912	502			5.8	14.2	1778	474			Gaseous only

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

GASEOUS EMISSION SUMMARY

Location: A

Fuel:

				Multiclone Out						Econ. Out						
TEST NO.	DATE	LOAD %	CONDITIONS	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	NO_2 ppm Wet	HC ppm Wet	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
13B			low grate Air	3.7	16.4	2000+	406									P.
14A	26 Aug 77	74	as found	5.4	14.5	150	455			6.5	13.3	99	448			Part Mech Out
14B		69	" "	5.6	15.1	95	440			6.6	13.9	81	426			Brink " "
15	27 Aug 77	73	" "	41.5	15.6	264	428			5.9	13.6	393	429			Part. " "
16	30 Aug 77	59	" "	6.1	13.7	104	473			7.5	12.3	102	474			Part Mech + ESP out
17	31 Aug 77	52	" "	6.3	13.5	83	434			7.3	12.6	66	416			Part ESP out + Stack
			STACK EMISSIONS →							7.8	12.0	77	423			
18A	11 Sep 77	46	as found	7.4	11.7	62	386			8.5	10.8	58	390	886	10	Sox Mech out
18B			" "	7.1	13.0	52	409			8.6	11.5	51	422	313	5	SO_x at stack
			STACK EMISSIONS →							8.5	11.3	51	411			
19	12 Sep 77	44	as found	6.8	13.0	44	386			8.3	11.4	43	384			Brink Mech. out
20	14 Sep 77	42	" "	5.3	14.8	44	306			6.9	13.1	79	294	1086	11	Sox Mech outlet Brink ESP outlet

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

GASEOUS EMISSION SUMMARY

Location: A

Fuel:

				BOILER OUTLET						ECON. OUTLET						
TEST NO.	DATE	LOAD %	CONDITIONS	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	NO_2 ppm Wet	HC ppm Wet	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
21	23 Sep 77	82	w/o reinjection	4.5	15.8	998	392			—	—	—	—			Part boiler outlet
			MULTICLONE OUTLET	EMI	SSION	S →				5.8	13.7	1436	391			
22	23 Sep 77	83	with reinjection	4.1	16.1	1600	362			—	—	—	—			Part boiler outlet
			MULTICLONE OUTLET	EMI	SSIONS	→				5.0	14.6	1148	367			
23	24 Sep 77	59	with reinjection	4.4	15.7	104	388			7.2	12.8	159	404			Part boiler outlet
			MULTICLONE OUTLET	EMI	SSIONS	→				5.6	14.7	158	377			
24	24 Sep 77	59	w/o reinjection	4.8	15.4	150	370			—	—	—	—			Part boiler outlet
			MULTICLONE OUTLET	EMI	SSIONS	→				5.9	14.2	157	396			

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

GASEOUS EMISSION SUMMARY

Location: A

Fuel: Kemmerer Coal

TEST NO.	DATE	LOAD %	CONDITIONS	Boiler Outlet O_2 % Dry	Boiler Outlet CO_2 % Dry	Boiler Outlet CO ppm Dry	Boiler Outlet NO ppm Dry	Boiler Outlet NO_2 ppm Wet	Boiler Outlet HC ppm Wet	Econ. Outlet O_2 % Dry	Econ. Outlet CO_2 % Dry	Econ. Outlet CO ppm Dry	Econ. Outlet NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
25	5 Oct 77	74	9" O.F air	5.0	14.8	450	439									Gascon only
		1	3" OF air	4.4	15.3	802	423									" "
26	6 Oct 77	70		5.05	14.8	413	446			7.3		439	381			Port BLR OUT
		74		4.6	15.7	405	416			6.95		328	436			Port Multiclon out
27	8 Oct 77	81		4.2	15.4	1022	388			6.1		2000+	387			SASS BLR outlet
28	10 Oct 77	84	4" OF Air	3.9	16.4	1076	408			6.3		2000+	404			Port. BLR OUT
29	10 Oct 77	85	9" O.F Air	3.8	15.0	480	398			6.3		429	441			" " "
30	13 Oct 77	80		4.0	—	383	460			6.6		290	506			Brink " "
31	14 Oct 77	53	5" OF Air	2.6	—	181	196									Gascous
		|	Front Bottom 2"	2.6	—	293	196									
		|	Front Bottom 10"	2.6	—	117	201									
		56	5" O.F. air	3.6	—	233	243									
		|	Front Top 2"	3.5	—	231	244									
		|	Front Top 10"	3.45	—	231	239									
32	15 Oct 77	83		5.2	15.0	219	497									SASS Dir. out

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

GASEOUS EMISSION SUMMARY

Location: A

Fuel: Consolidation Coal

				BOILER OUTLET						ECON. OUTLET						
TEST NO.	DATE	LOAD %	CONDITIONS	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	NO_2 ppm Wet	HC ppm Wet	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
34	29 Oct 77	76	10.5% O.F. air	5.86		300	353							504	10	Blr out } SASS
										6.5		483	315	479	12	ESP out } Part.
35	30 Oct 77	76	5.5% O.F. air	5.97	.	313	394							410	7	Blr out } SO_x
										6.4	.	243	382	353	2	ESP out }
36	1 Nov 77	~79	w/o reinjection	4.7	16.7	~2000	344			5.6	14.8	2000+	320			Part Boiler outlet
37	1 Nov 77	87	with reinjection	5.1	15.6	276	347			5.2	15.0	319	342			Part Boiler outlet
38	2 Nov 77	59	10.5% O.F. air	4.7	15.0	61	313			7.4	12.4	66	311			Part Boiler outlet
39	2 Nov 77	60	3.0% O.F. air	4.9	14.8	670	335			6.4	13.3	1134	333			Part Boiler outlet
40	11 Nov 77	66		6.9	12.8	108	546			8.1	11.3	155	529			SASS Boiler outlet

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A
TEST NO 1A
DATE 8-09-77

FUEL Stansbury
LOAD 64%
CONDITIONS As Found
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
DC Out		6.5	13.9	110	137	360	446									
ESP Out		7.8	12.0	122	167	300	410									
DC Out 1		5.4	14.5	205	237	340	393									
Stack		7.5	12.6	122	163	300	401									
DC Out 2		4.6	15.4	160	176	310	340									
DC Out 3		3.6	16.8	250	259	300	310									
DC Out 5		4.5	15.7	140	207	300	327									
DC Out 6		5.4	14.5	92	106	290	336									
DC Out 7		5.6	14.2	80	94	300	351									
D.C Out		4.3	15.7	160	173	310	334									
D.C Out	1PM	3.8	16.8	350	366	005										
Stack		5.65	14.5	600	709	005										Test 1B
DC Out 4		3.4	17.1	500	511	005										Test 1B
ESP Out		6.0	13.9	420	504	005										Test 1B
DC Out 1		4.4	16.0	350												Test 1B
DC Out 2		3.8	16.4	600		005										Test 1B
																Test 1B
DC out		3.85	16.58		439											Averages #1B
Econ out		6.0	13.9		504											Averages #1B
Stack		5.65	14.5		704											Averages #1B

AVERAGES

DC out		4.9	15.2		180		343									
Econ out		7.8	12.0		167		410									
Stack		7.5	12.6		163		401									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A
TEST NO 2 2A → H
DATE 8-10-77

FUEL Stansbury
LOAD 59%
CONDITIONS AS found
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry) unc	CO · ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
DC out		3.8	16.4	140	147	330	345									
Stack		5.6	14.2	150	175	285	333									
ESP out		5.6	14.2	150	175	325	380									
DC out 1		5.0	14.8	50	55	350	394									
DC out 2		4.7	15.1	80	88	380	420									
DC out 3		5.0	15.1	65	73	365	411									
DC out 4		4.5	15.4	80	87	375	409									
DC out 5		3.4	16.4	175	179	370	378									
DC out 6		3.5	16.4	122	126	330	339									
DC out 7		3.9	16.0	65	68	340	358									
DC out		4.3	16.0	80	86	320	345									2A - Reduce Air
DC out		3.6	16.8	122	126	305	316									2B - " "
DC out		2.7	17.9	270	266	290	285									2C - " "
DC out		1.7	18.9	1150	1072	275	256									2D - " "
Stack		4.25	15.4	875	941	235	253									
DC out		3.7	16.8	122	127	290	302									2E Raise Air
DC out		4.4	15.7	160	174	305	325									2F " "
DC out		5.1	14.8	80	91	315	358									2G " "
DC out		5.9	13.6	80	95	335	400									2H " "

AVERAGES

DC out		4.2	15.7		102.8		376									For Test # 2 only
Econ out		5.6	14.2		178		380									
Stack		4.93	14.8		525		293									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A
TEST NO 3
DATE 8-11-77

FUEL STANSBURY
LOAD 61 %
CONDITIONS LOW AIR
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO - ppm(dry) unc	CO - ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
DC out	9:45A	4.9	15.7	80	88	300	330									
Stack		6.7	13.0	80	101	275	357									
ESP out		5.9	13.9	170	203	286	340									
DC out 7		4.15	15.7	50	53	315	337									
DC out 6		4.1	16.0	145	159	335	367									
DC out 5	10:20A	3.2	17.1	350	364	336	339									
DC out 4		3.7	16.4	270	281	355	369									
DC out	10:45pm	4.0	16.4	270	286	295	312									
DC out 3		4.5	15.7	122	133	315	344									
DC out 2		4.7	15.9	70	77	290	320									
DC out 1		4.86	15.4	65	72	295	329									
DC out		3.7	16.8	270	281	295	307									
DC out	Noon	3.75	16.8	190	198	285	297									
DC out	1:16pm	3.7	17.1	350	364	295	307									
Stack		5.8	14.5	330	391	260	308									
DC out 7		4.2	16.4	65	70	290	311									
DC out 6		4.1	16.8	122	130	290	309									
DC out 5		3.4	17.9	420	430	286	292									
DC out 4		3.3	17.9	600	610	290	295									
DC out 3		4.2	16.8	110	118	300	322									
DC out 2		4.8	16.0	80	89	300	334									
DC out 1		4.5	16.2	80	87	295	322									

AVERAGES

DC out		4.1	16.9		219		312									
Econ out		5.9	13.9		203		340									
Stack		6.25	13.75		246		333									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A
TEST NO 4
DATE 8-17-77

FUEL STANSBURY
LOAD 60%
CONDITIONS HIGH AIR
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
DC Out	10:40 Am	6.3	13.6	50	61	375	460									
STACK	10:45 Am	7.9	12.0	50	64	370	509									
ESP Out		7.7	11.6	50	68	380	515									
DC out 1		8.2	11.2	65	92	385	543									
DC out 7		6.3	13.3	55	67	390	478									
DC out 2	11:15 Am	6.8	12.8	65	83	430	546									
DC out 6		5.7	14.4	55	66	366	418									
DC out 3		7.1	12.8	50	65	380	493									
DC out 5		5.3	14.5	55	63	370	425									
DC out 9		5.5	14.5	55	64	405	471									
DC Out	Noon	6.1	13.9	55	67	405	490									
STACK		7.9	12.0	55	76	365	489									
DC out 1	1:08 Pm	7.3	12.5	65	86	380	500									
DC out 2	1:14 Pm	6.4	13.3	65	80	390	481									
DC out 3	1:21 Pm	6.4	13.3	65	80	410	506									
DC out 4		6.2	13.6	70	85	445	542									
DC out 6		4.8	14.8	50	56	425	473									
DC out 4		6.4	13.9	58	72	390	481									
DC out 9		7.0	13.0	92	118	395	509	410	528	410	529					w Hot Line
DC out 4		6.0		92	111	405	486	395	475	395	475					Hot Line
DC out	4:30p	6.8														Brink Test
DC out	4:56p	7.0														Brink Test
DC out		7.2														Brink Test
Brink		7.0														Average

AVERAGES

DC out		6.3	13.6		77		497									
Eco. Out		7.7	11.6		68		515									
Stack		7.9	12.0		72.5		499									
DC out		6.5	13.0		114.5		497.5		501.5		501.5					Hot Line

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A — FUEL STANSBURY

TEST NO 5 — LOAD 72 %

DATE 8-18-77 — CONDITIONS Low Air

DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
DC Out	11:45 Am	4.9	15.1	560	627	330	369									
STACK		6.0	13.7	846	1009	300	360									
ESP Out		6.0	13.9	300	360	360	432									
DC Out 6	12:10 Pm	3.0	17.5	1520	1520	345	345									
DC out 5		3.15	17.5	1150	1160	345	348									
DC out 4		3.9	16.4	350	369	380	400									
DC out 3		4.5	16.0	50	55	370	404									
DC out 2		5.2	15.1	66	74	360	410									
DC out 1		5.4	14.5	60	63	360	404									
DC out 7		3.3	17.5	500	509	330	336									
DC out	1:40 Pm	3.8	16.8	500	523	325	340									

AVERAGES

DC out		4.1	16.4		536		385									
Econ out		6.0	13.9		360		432									
Stack		6.0	13.7		1009		360									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE A
TEST NO 6
DATE 8-18-77

FUEL STANSBURY
LOAD 70 %
CONDITIONS HIGH AIR
DATA TAKEN BY PLL

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
DC out	3:30 Pm	5.6	15.0	490	573	345	404									
DC out 2	3:48 Pm	7.2	12.9	130	170	345	451									
DC out 3	4:08 Pm	6.4	13.8	100	123	370	457									
DC out 4	4:18 Pm	5.2	15.1	250	285	400	456									
DC out 5	4:36 Pm	4.4	16.5	490	532	358	388									
STACK	4:37 Pm	7.15	13.0	490	638	302	393									
DC out 6	4:39	4.25	16.6	1090	1172	310	333									
DC out 7	4:48	5.5	15.0	300	349	300	349									
ESP out	5:00	7.65	12.4	200	270	305	412									
DC out 1	5:07	7.55	12.4	160	215	340	456									
Post Cal		OK	OK	OK		10 ppm	low									

AVERAGES

DC out		5.8	14.7		392		414									
Econ Out		7.7	12.4		270		412									
Stack		7.15	13.0		638		393									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A
TEST NO 7
DATE 8-19-77

FUEL STANSBURY
LOAD 68%
CONDITIONS AS FOUND
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry) unc	CO · ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
DC out		5.2	15.1	150	171	360	399									7A - As Found
DC out		4.0	16.4	620	657	345	365									7B - Reduce Air
DC out		3.4	17.1	800	818	320	327									7C - Reduce Air
DC out		3.0	17.8	1050	1050	320	320									7D - Reduce Air
DC out		5.0	15.4	122	137	360	394									7E - Raise Air

AVERAGES

DC out																See Above
Econ Out																Vary Air
Stack																

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A
TEST NO 8
DATE 8-20-77

FUEL STANSBURY
LOAD 8A - 65%
8B - 52%
CONDITIONS AS FOUND
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
DC out	10:00 Am	4.35	15.7	500	541	340	368									8A
Stack	10:15	5.8	13.5	220	261	320	379									8A
ESP out		6.1	13.3	236	284	330	399									8A
DC out 1		5.0	14.8	50	56	360	405									8A
DC out 4		4.2	15.7	270	289	365	391									8A - SOx PROBE
DC out 7		5.1	14.5	40	45	390	442									8A
DC out 2		5.1	14.5	50	57	375	425									8A
DC out 6		4.8	14.8	122	136	376	417									8A
DC out 4		4.1	15.7	350	373	365	389									SOx PROBE
DC out 3		5.0	15.1	80	90	375	422									8A
DC out 5	11:20 Am	3.9	16.8	440	463	370	390									8A
DC out		4.8	14.9	175	196	355	394									8A
ESP out	11:40 Am	6.6	12.4	50	63	325	407									8A
Stack	11:45 Am	6.2	13.0	122	149	320	390									8A
Stack	1:30 Pm	9.0	11.0	65	98	315	474									8B
DC out	2:30 Pm	5.1	15.1	450	510	355	402									8B
ESP out		7.8	12.2	122	168	335	458									8B
Stack	3 Pm	7.6	12.5	45	61	315	424									8B SOx PROBE
D.C out 1		7.5	12.4	40	53	370	494									8B
DC out 2		6.9	13.0	40	51	355	454									8B
DC out 3		6.8	13.3	40	51	366	451									8B
DC out 4		6.4	13.9	50	62	350	432									8B
Stack	3:25 Pm	8.6	11.0	50	73	305	444									8B SOx PROBE
DC out 5		6.4	13.9	40	49	345	426									8B
DC out		4.8	14.9		141		417									Average for 8A
Econ out		6.4	13.9		174		403									8A
Stack		6.0	13.25		205		3845									8A
SOx Probe		4.15	15.7		331		390									8A

AVERAGES

DC out		6.8	13.3		53		451									Average for 8B
Econ out		7.8	12.2		168		458									8B
Stack		8.4	11.5		77.3		447.3									8B
SO$_x$ Probe		8.1	11.75		67.0		434									Stack SO$_x$ 8B

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A
TEST NO 9
DATE 8-23-77

FUEL STANSBURY
LOAD 61 %
CONDITIONS AS FOUND
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry) unc	CO · ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
DC out	11:20 Am	5.1	15.4	70	79	365	414									
STACK		6.4	13.7	95	117	315	389									
ESP out		6.2	14.2	160	195	305	371									
DC out 1		5.2	15.1	40	46	370	422									
DC out 2		4.3	16.0	60	65	360	388									
DC out 3	11:45 Am	4.4	16.0	50	54	370	401									
DC out 5		4.1	16.8	270	288	330	352									
DC out 6		4.3	16.0	220	237	340	367									
DC out 7		6.0	14.5	50	60	360	432									
STACK	12:30 Pm	7.0	13.0	40	52	325	419									
DC out		5.5	14.8	92	107	330	384									
DC out		5.0	16.4	122	137	330	372									
DC out 4		4.5	16.0	175	191	330	360									SOx PROBE
STACK		9.4	10.0	80	126	315	491									
DC out 4	2:50 Pm	5.8	13.9	30	36	316	373									SOx PROBE
ESP out		7.8	12.0	30	41	280	383									
DC out 1	3:13 Pm	4.5	15.7	95	104	350	382									
DC out 2		5.6	14.8	40	47	345	404									
DC out 3		5.2	15.4	55	63	330	376									
DC out 7	4:09 Pm	4.2	16.4	92	99	305	327									
DC out 6		4.8	15.9	85	94	310	345									
DC out		4.4	16.4	95	103	315	342									

AVERAGES

DC out		4.9	15.6		81		367									
Econ out		7.8	12.0		41		383									
Stack		7.6	12.2		98.3		433									
SO_x Probe		5.15	14.95		113.5		366									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ADMA-ELEA
TEST NO 10
DATE 8-24-77

FUEL STansbury
LOAD 37
CONDITIONS as found
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp.		9.25	10.6	70	108	345	561									
Stack	9:40 AM	10.25	9.2	65	109	335	563									
Scrubber In	11AM	11.5	7.4	45	86	310	590									
# 1		9.0	10.4	65	98	370	557									
# 7		9.6	10.0	65	103	325	515									
# 2		8.8	10.6	50	74	330	487									
# 6		10.0	9.5	50	82	320	526									
# 3		10.1	9.0	65	108	335	557									
# 5		10.25	9.8	50	84	335	563									
# 1		10.5	8.4	65	115	335	591									
# 2		10.5	8.8	50	86	340	595									
# 5		10.25	8.8	40	67	350	588									
# 6		10.25	8.6	40	71	330	582									
# 7		10.25	8.4	40	71	325	574									
Stack		10.0	9.2	40	66	350	575									
Scrubber In		9.75	9.4	35	56	355	570									
# 3		8.75	10.0	40	59	355	523									

AVERAGES

Multi-clone		9.9	9.5		83		554									
ECON OUT		10.6	8.4		71		580									
Stack		10.1	9.2		87.5		569									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA-Site A
TEST NO 11-A TO 11-F
DATE 8-24-77

FUEL Stansbury
LOAD 41
CONDITIONS Vary Excess Air
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
11-A Comp	1 45 pm	7.75	12.7	30	41	360	490									Vary O2 Low O2
11-B Comp		8.0	12.4	40	56	365	506									Raise O2
11-C Comp		8.5	11.6	50	72	375	541									Raise O2
11-D Comp		9.1	11.2	65	99	385	584									Raise O2
11-E Comp		9.5	10.6	65	102	380	597									Raise O2
11-F Comp		7.5	13.0	35	47	335	448									Return TO AS Found O2

AVERAGES

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA site A — FUEL Stansbury

TEST NO 12 — LOAD 45

DATE 4/5 — CONDITIONS As Found

DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp #4		7.5	13.0	50	67	325	434									
Stack		8.3	12.0	40	57	295	419									
Scrubber Inlet		7.25	13.0	30	39	290	380									
#1		6.5	13.9	30	37	330	460									
#7		5.5	13.4	3x	41	300	349									
#2	3:45	6.4	14.2	40	49	360	444									
#6		6.0	14.5	40	48	350	420									
#3	4 PM	6.0	14.5	40	48	360	432									
#5		6.0	14.8	40	49	360	441									
Comp #4		6.3	14.7	40	49	360	441									

AVERAGES

Multi-Clone Out		6.1	14.5		46		414									
Fan Out		7.2	13.0		39		380									
Stack		8.3	12.0		57		419									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA Site A
TEST NO 13 A & B
DATE 8-25-77

FUEL Stansbury
LOAD 77
CONDITIONS A as Found B reduce
DATA TAKEN BY GLN

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
13 A Comp	9 AM	3.5	12.1	500	514	420	432									
Comp-4	9:20 AM	5.3	14.8	270	310	420	482									
Stack	9:35 AM	6.0	13.9	500	600	390	464									
Comp-4	9:50 AM	5.2	15.1	800	912	440	502									
Scrubber INLET		1.8	14.2	1500	1778	400	474									
13 B Comp-4	10:20 AM	3.7	16.4	2000	2000+	390	406									
Comp-4	11 AM	5.2	14.8	535		420										

AVERAGES

14 A Multi-Clone out		5.2	15.1		912		502									
Econ. out 14 B		5.8	14.2		1778		470									
Multi out		3.7	16.4		2000+		406									
Stack		6.0	13.9		600		464									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA Site A

TEST NO 14 A & B

DATE 8-26-77

FUEL Stansbury

LOAD 14-A - 74 / 14-B - 69

CONDITIONS 14-A High OFA 14-B as Found

DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
14A Comp		5.0	15.1	110	124	340	434									
Scrubber inlet	935 AM	6.5	13.3	80	99	360	448									
Stack		6.5	13.3	122	152	350	436									
#1		6.7	13.0	92	116	380	479									
#2		5.4	14.5	150	173	385	445									
#3	1005 AM	4.6	15.4	330	362	385	422									
#4		4.7	15.4	160	177	395	436									
#5		5.4	14.5	60	69	405	468									
#7		6.0	13.6	70	84	410	493									
Stack	1045 AM	6.5	13.0	190	236	355	441									
Comp 2-7	1130 AM	5.0	15.4	420	473	370	417									
Comp -2		5.0	15.4	350	394	350	394									
#1,2,3,6,7		5.7	14.5	122	144	290	342									
14-B Comp	330 pm	6.9	13.6	92	118	350	448									
#3		6.4	14.2	92	114	380	469									
Stack		6.6	13.9	125	156	320	401									
S. inlet		6.6	13.9	65	81	340	426									
#1	410 pm	5.8	14.5	95	113	370	439									
#2		6.1	14.8	85	103	380	460									
#4		5.5	15.4	80	93	390	453									
#1,2,4,6,7		5.4	15.7	125	144	350	404									
#6		5.0	16.0	70	79	375	422									
#7		4.9	16.0	60	67	355	398									
Stack		6.5	13.4		181		426									

AVERAGES

14A multi out	-	5.4	14.5		150		455									Part Mech out
Econ out	-	6.5	13.3		99		448									"
14B multi out	-	5.6	15.1		95		440									Brink Mech out
Econ out	-	6.6	13.9		81		426									"

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE AMA Site A FUEL Stansbury

TEST NO 15 LOAD 73

DATE 8-22-77 CONDITIONS low Air

DATA TAKEN BY

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp	11:00	4.4	16.0	520	564	360	390									
# 7	4:23	4.3	16.0	100	108	405	437									
# 2	12:40	5.2	14.8	220	251	390	444									
# 3	12:50	4.8	15.3	110	122	394	438									
# 4	12:59	3.95	16.4	120	127	406	429									
# 1	12:46	5.25	14.7	170	160	400	457									
# 5	12:55	4.4	15.8	520	564	360	390									
# 6	13:11	3.8	16.4	490	513	385	403									
Stack	13:24	5.85	13.8	260	309	360	428									
Economizer inlet	13:30	5.9	13.6	330	393	360	429									

AVERAGES

Multi-cyclone out		4.5	15.6		264		428									
Econ out		5.9	13.6		393		429									
Stack		5.85	13.8		309		428									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA Site A

FUEL Stansbury & Kemmer

TEST NO 16

LOAD 59

DATE 8-30-77

CONDITIONS As Found

DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp	12:00 pm	6.6	13.3	80	100	375	469									
Stack		7.9	11.4	80	110	350	481									
Scrubber probe		7.4	12.2	80	106	320	424									
#1		6.7	13.1	80	101	340	428									
#2		7.1	12.6	80	104	360	466									
SCRUBBER		7.7	11.9	80	108	375	508									
#3	12:45	6.9	12.7	83	106	430	549									
SCRUBBER	12:49	-	-	-	-	-	-									
#4	13:04	5.6	14.2	90	165	445	520									
#5	13:16	6.6	13.0	80	100	-	-									
Scrubber	13:23	6.95	12.7	80	102	390	500									
#6	13:30	4.7	15.4	90	99	405	447									
Scrubber	13:35	7.85	11.6	85	116	378	517									
#7	13:45	5.2	14.8	85	97	380	433									
Scrubber		7.25	12.5	65	85	365	478									
Comp	15:00	6.5	14.0	85	106	345	431									
SCrubber		7.6	12.6	80	107	330	443									

AVERAGES

Multi-Cone out		6.1	13.7		104		473									
Econ out		7.5	12.3		102		474									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA site A FUEL Stansbury - Kenmore

TEST NO 17 LOAD 52

DATE 8-31-77 CONDITIONS as found

DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp		7.2	13.0	110	143	370	483									
Scrubber Inlet	3:15 pm	7.0	13.0	50	64	335	431									
#1		6.6	13.6	80	100	380	475									
Stack		7.5	12.2	60	80	350	467									
#2		8.2	11.6	110	155	400	563									
#3	4:00 pm	7.2	12.2	80	104	350	457									
#4		5.6	14.2	50	58	355	405									
#5		6.1	13.6	40	48	335	405									
Stack	4:15 pm	7.5	12.2	40	53	290	387									
#6		5.4	14.5	50	58	330	381									
#7		5.3	14.8	50	67	330	378									
Scrubber Inlet	4:35 pm	7.5	12.2	50	67	300	400									
Comp		6.4	13.3	50	62	335	413									
Stack	5:30 pm	7.7	12.2	55	74	305	410									
Comp		6.4	13.9	65	80	310	392									
Stack	6:40 pm	8.4	11.4	70	100	310	443									
Comp		7.5	13.0	80	107	340	453									
Scrubber Inlet	6:40 pm	9.0	11.0	80	120	315	473									
Comp		7.5	13.0	92	123	340	453									

AVERAGES

multi-clone out		6.3	13.5		83		429									
Econ out		7.3	12.6		66		416									
Stack		7.8	12.3		77		428									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE APMA-site A
TEST NO 18A - 18B
DATE 9-11-77

FUEL Stansbury
LOAD 46
CONDITIONS as Found
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
18A																
Comp		8.0	12.0	30	42	300	416									
Comp	11:00 AM	8.1	11.8	40	56	320	448									
Stack		8.7	10.6	35	51	310	455									
#1		7.0	12.4	35	45	290	373									
Scrubber Inlet	11:30 Inlet	8.5	10.8	40	58	270	390									
#2		7.0	12.2	40	52	300	386									
#3		6.7	11.8	45	57	300	378									
#5		7.8	11.4	50	68	290	396									
Sox probe #4		6.8	12.5	40	63	310	404									
Sox probe #4	12:30 pm	7.0	12.2	50	64	290	373									
#6		7.8	11.2	40	68	290	396									
#7	12:40 pm	8.1	10.4	55	79	270	387									
Sox probe #4 18A		6.4	12.2	60	77	300	384									
Comp		7.1	13.0	40	52	315	409									
Scrubber Inlet		8.6	11.5	35	51	290	422									
Stack		8.7	11.2	40	59	280	411									
Sox probe Stack	4:30 PM	8.7	11.2	40	59	280	411									
Sox probe Stack	5:05 pm	8.2	11.6	30	42	290	409									
Sox probe Stack		8.3	11.2	30	43	290	412									
Stack		8.5	11.2		51		420									

AVERAGES

18A Multi-Clone out		7.4	11.7		62		386									
Econ-out		8.8	10.8		58		390									
APH - Clean out		7.1	13.0		52		409									
Econ out		8.6	11.5		51		422									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE APMA-site A
TEST NO 19
DATE 9-12-77

FUEL STansbury
LOAD 44
CONDITIONS as Found
DATA TAKEN BY GLM

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp-1	15 Min	6.8	13.5	30	38	330	408									
Stack		8.2	11.4	25	35	320	451									
#1		6.3	13.4	25	31	330	405									
Scrubber Inlet		8.3	11.4	30	43	270	384									
#2		6.1	14.2	30	36	330	399									
#4		6.4	13.6	30	37	312	384									
#5		7.4	12.1	40	53	280	371									
#6		7.5	12.2	40	53	290	386									
#7		7.4	12.2	40	53	280	371									
Comp-3		6.5	13.3	40	50	300	379									

AVERAGES

Multi-Cleaned		6.8	13.0		44		386									
Scrubbed		8.3	11.4		43		384									
Stack		8.2	11.4		35		451									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA-site A — FUEL Kemmerer

TEST NO 20 — LOAD 42

DATE 9-14-77 — CONDITIONS As Found

DATA TAKEN BY JEC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp		6.6	14.2	20	23	260	304									
Stack		7.6	14.5	20	27	230	310									
#1		6.0	13.6	20	24	270	321									
Scrubber Outlet		8.0	14.6	20	28	240	333									
#2		5.9	13.6	20	24	290	346									
#3		6.1	13.3	20	24	290	351									
#5		7.3	12.4	20	26	260	342									
#6		6.9	12.2	25	32	270	345									
#7		6.8	12.4	25	32	260	330									
Comp		3.7	12.1	110	114	240	250									
Stack		5.7	14.8	85	100	210	247									
#1		2.7	6.2	122	120	250	246									
Scrubber Outlet		5.8	14.5	110	130	215	255									
#2		3.2	12.9	110	111	250	253									
#3		3.4	12.5	50	51	250	256									
#5		5.2	15.1	30	34	260	296									
#6		4.7	15.7	25	29	260	287									
#7		4.9	15.4	20	22	260	291									
Comp		4.9	15.1	30	34	270	302									

AVERAGES

Scrubber Outlet		5.3	14.8		44		306									
Econ Outlet		6.9	13.1		79		294									
Stack		6.7	13.2		64		279									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA - SITE A
TEST NO 21
DATE 9/21/77

FUEL Kemmerer Coal
LOAD 80%
CONDITIONS Without Fly Ash reinjection
DATA TAKEN BY JEC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry) unc	CO · ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
comp. 4-7		4.6	15.1	760	834	370	406									
BLROUT-6		4.5	13.7	630	709	360	398									
BLROUT-4		6.5	13.3	520	646	360	447									
BLROUT-7		3.3	17.5	700	712	340	346									
DC out-1		5.4	14.2	1840	2250	340	405									
DC out-2		5.1	13.3	1400	1580	360	362									
DC out-3		6.4	13.6	330	430	390	407									
comp 4-7		4.5	15.7	710	775	360	393									

AVERAGES

BLR OUT		4.5	15.8		999		392									
DC out		5.63	13.7		1420		3913									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ADMA - SITE A
TEST NO 22
DATE Sept, 22, 1978

FUEL Kommerer Coal
LOAD 80%
CONDITIONS With reinjection
DATA TAKEN BY JEC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
comp 4-7		4.4	15.7		2000+	330	380									
BLR OUT-5		2.4	18.2		2000+	240	329									
BLR OUT-6		4.1	16.0	800	892	360	383									
BLR OUT-7		5.5	14.5	300	346	350	406									
OLR OUT-4		5.2	14.5	810	933	330	376									
BLR OUT-5		3.1	17.5		2000+	320	322									
Stack		6.6	13.0	1160	1450	300	375									
DC OUT-2		4.1	14.5	1650	1757	315	336									
DC OUT-3		5.5	14.5	320	383	330	383									
DC OUT-1		5.3	14.8	1080	1238	335	384									

AVERAGES

BLR OUT		4.1	16.1		1600		362									
DC OUT		5.0	14.6		1148		367									
Stack		6.6	13.0		1450		375									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA - Site A
TEST NO 23
DATE 9/24/77

FUEL Kemmerer Coal
LOAD 60%
CONDITIONS With reinjection
DATA TAKEN BY JEC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp H-7		4.3	15.7	122	133	360	393									
BLR OUT-6		2.9	14.2	50	50	360	363									
BLR OUT-5		4.7	15.7	50	55	380	420									
BLR out-4		5.7	14.2	205	241	350	412									
BLR out-7		5.3	14.2	80	92	340	390									
Stack		7.0	12.8	120	154	300	386									
DC out-1		5.7	14.2	175	201	340	403									
Econ-out		7.2	12.8	122	154	310	404									
DC out-3		5.4	15.1	122	141	350	404									
DC out-2		5.5	14.8	110	128	—										

AVERAGES

BLR out		4.4	15.7		104		378									
Econ out		7.2	12.8		154		404									
DC out		5.6	14.7		158		377									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA - SITE A
FUEL Kemmerer Coal
TEST NO 24
LOAD 60%
DATE 9/24/77
CONDITIONS As found - W/O fly ash reinjection
DATA TAKEN BY DEC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry) unc	CO · ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp 4-7		5.0	15.1	122	137	340	383									
BLR OUT-5		3.9	16.4	190	200	310	326									
PLR OUT-6		3.6	16.8	65	67	350	362									
BLR OUT-7		5.5	14.5	140	163	350	406									
BLR OUT-4		6.0	13.9	140	161	320	384									
Stack		7.5	12.2	122	163	300	400									
DC OUT-1		6.8	13.9	120	134	320	342									
DC OUT-2		5.4	14.8	122	141	340	392									
DC OUT-3		6.9	13.9	122	145	340	405									
BLR OUT-5		5.0	15.1	92	104	340	383	220	254	260	293					

AVERAGES

BLR OUT		4.8	15.4		150		370		254		293					
DC OUT		5.9	14.2		157		396									
Stack		7.5	12.2		163		400									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA - SITE A | FUEL KEMMERER COAL

TEST NO 25 | LOAD 74%

DATE 10/5/77 | CONDITIONS Vary Over fire Air

DATA TAKEN BY JOB

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
Comp Blr out	13:40	5.0	14.8	400	450	390	439									9" OFA
Comp Blr out	14:05	4.4	15.3	740	802	390	423									3" OFA
																Gaseous only

AVERAGES

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO unc	CO cor	NO unc	NO cor	NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp Blr out		5.0	14.8		450		439									9" OFA
"		4.4	15.3		802		423									3" OFA

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA - SITE A
TEST NO 26
DATE 10/6/77

FUEL Kemmerer Coal
LOAD 70% A 74% B
CONDITIONS As Found
DATA TAKEN BY J.O.B.

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp 4-7	10.00	5.2	14.8	420	478	404	460									Test 26A
Econ out	10:20	7.2	12.2	460	600	380	496									
BLR out-6	10:35	5.5	14.0	350	406	390	453									
BLR out-5	10:50	3.5	16.8	930	957	420	432									
BLR out-4	11:05	4.8	15.1	130	167	410	456									
BLR out-7	11:20	6.4	13.3	100	123	360	444									
DC out-3	11:30	6.4	13.2	260	321	360	444									
DC out-2	11:42	4.6	15.1	850	933	400	439									
DC out-1	11:53	4.9	13.9	210	250	385	427									
Econ out	12:00	7.4	12.0	210	278	200	265									
Comp 4-7	15:15	4.9	15.3	280	343	360	402									Test 26B
DC out 3	15:20	5.5	14.5	200	232	350	400									
DC out-2	15:30	5.4	14.6	160	185	370	427									
DC out-1	15:40	6.7	13.1	190	227	365	429									
Econ out	15:50	7.2	12.6	165	215	335	437									
BLR out-4	16:00	6.0	13.9	120	144	390	468									
BLR out-5	16:10	4.7	15.7	160	177	410	453									
BLR out-6	16:20	2.5	16.1	1160	1129	358	345									
BLR out-7	16:35	5.1	15.2	150	170	350	396									
Econ out	16:50	6.7	13.2	350	441	345	434									
DC out		5.63	14.07		501		435									26A
DC out		5.87	14.07		215		429									26B

AVERAGES

BLR out		5.05	14.8		413		446									Test 26A
Econ out		7.3	12.1		439		381									" "
BLR out		4.6	15.7		405		416									Test 26B
Econ out		6.95	12.9		928		434									" "

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA - SITE A
TEST NO 27
DATE 10/8/77

FUEL Kemmerer Coal
LOAD 81%
CONDITIONS As found
DATA TAKEN BY JEC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Econ Out	11:04	6.1	13.6		>2000	320	387									SADS AT
Stack	11:36	6.7	12.8	820	1032	310	390									BLR out
Comp 4-7 x 5	11:50	4.3	15.4	1010	1089	350	377									
BLR out-4	12:05	4.6	14.8	1990	2184	340	373									
BLR out-6	12:26	2.9	16.4	1520	1512	340	338									
BLR-7	12:41	4.3	14.8	160	179	370	411									
DC out-1	13:05	5.6	13.9	960	1121	340	397									
DC out-2	13:34	4.9	15.1	620	693	330	391									
DC out 3	13:47	6.3	13.6	250	306	370	457									
Comp 4-7 x 5	14:00	4.3	16.0	1100	1186	390	420									
BLR out-4	14:15	4.3	14.5	1150	1240	340	365									
BLR out 6	14:31	3.6	16.4	820	843	320	383									
BLR out-7	14:43	5.0	15.4	150	169	410	461									

AVERAGES

BLR out		4.2	15.4		1022		388									
Econ out		6.1	13.3		>2000		387									
Stack		6.7	12.8		1032		390									
DC out		5.6	14.2		707		413.7									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA - SITE A
TEST NO 28
DATE 10/10/77

FUEL Kommerer Coal
LOAD 84%
CONDITIONS 4" OFA
DATA TAKEN BY JEC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
COMP 6-7	11:35	2.7	15.7		>2000	310	305									
BLROUT-5		1.3	16.8		>2000											
BLROUT-6	11:50	2.6	17.5	1040	1017	350	342									
BLROUT-7		7.1	12.0	440	570	350	403									
BLR OUT-4	12:15	4.7	15.4	610	674	360	393									
ECON OUT	12:30	6.3	13.3		2000+	330	404									
DC OUT #1	12:45	4.1	16.0	2000	2450	350	373									
DC OUT #2	11:50	4.4	15.1	2000+	2170	340	369									
COMP 4-7	13:05	3.5	14.8	2000		340	356									

AVERAGES

BLR OUT		3.9	15.4		1022		388									
ECON OUT		6.3	13.3		2000+		404									
DC OUT		4.25	15.6		2150		371									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ADMA SITE A

TEST NO 29

DATE 10/10/77

FUEL Kemmerer Coal

LOAD 85%

CONDITIONS 9" OFA

DATA TAKEN BY JEC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
COMP 4-7	14:25	4.0	14.8	610	646	360	381									
BLR OUT-6		3.5	16.8	920	946	370	381									
BLR OUT-5	14:45	1.9	17.9	450	424	370	349									
BLR OUT-4	14 55	3.5	17.5	175	180	420	432									
BLR OUT-7		6.4	13.3	300	370	350	432									
Econ OUT	15:15	6.3	15.7	350	429	360	441									
DC OUT-1	15:30	4.0	16.8	450	476	410	434									
DC OUT-2	15:37	5.2	15.1	300	342	370	422									
DC OUT-3	15:46	6.8	13.0	280	335	360	436									

AVERAGES

Probe Position	Time	O_2	CO_2	CO unc	CO cor	NO unc	NO cor	NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
BLR OUT		3.8	16.4		480		398									
ECON OUT		6.3	15.7		429		441									
DC OUT		5.3	15.0		391		437									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA - SITE A
TEST NO 30
DATE 10/12/77

FUEL Kemmerer Coal
LOAD 80%
CONDITIONS A_2 found
DATA TAKEN BY RAP

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry) unc	CO · ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
DC out Comp	13:30	5.1	14.9	370	419	422	478									
STACK	13:37	6.5	13.3	330	410	415	516									
BLR out Comp	13:43	3.8	13.3	580	607	395	413									
Econ out	13:50	6.4	13.4	270	334	395	489									
BLR out-7	13:55	4.5	15.7	116	126	475	518									
BLR out-6	14:00	2.4	18.0	820	793	430	433									
BLR out-5	14:05	5.0	11.4	205	230	380	427									
DC out-3	14:15	5.0	12.9	210	236	440	498									
DC out-2	14:28	4.7	16.0	300	332	425	469									
DC out-1	14:37	6.1	14.2	205	248	435	526									
DC out	14:42	5.55	14.8	227	264	455	531									
BLR out	14:45	4.65	14.2	195	2143	445	490									
Econ out	—	6.7	13.3	195	248	415	527									

AVERAGES

BLR out		4.0	15.0		383		460									
Econ out		6.6	13.3		429		441									
Stack		6.5	13.3		410		576									
DC out		5.3	14.6		2999		501									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA - SITE A
TEST NO 31
DATE 10/14/77

FUEL Kemmerer Coal
LOAD 53% (A,B,C) 56% (D,E,F)
CONDITIONS OFA Variation
DATA TAKEN BY PLL

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO - ppm(dry) unc	CO - ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
BLR OUT	11:35	2.6	0.6	185	191	200	196									31A All 5"
	11:41	2.6	13.4	300	293	200	196									31B FL-2"
	11:48	2.6	13.4	120	117	205	201									31C FL-10"
	13:26	3.5	12.2	225	231	235	241									31D All-5"
	13:32	3.5	12.4	225	231	237	244									31E FU-2"
	13:39	3.45	12.2	225	231	233	239									31F FU-10"
	13:50	3.45	11.6	140	145	213	218									All 5"
	14:01	3.40	11.6	145	149	118	121									R-L-2"

AVERAGES

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ADMA SITE-A

TEST NO 32

DATE 10/15/77

FUEL Kemmerer Coal

LOAD 83%

CONDITIONS as found

DATA TAKEN BY JOB

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET): NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp 4,5,7	13:15	5.15	14.9	500	568	410	466									
BLR out-7	13:24	5.15	14.8	220	250	435	494									
BLR out-5	14:14	4.9	15.4	150	168	440	492									
BLR out-4	14:24	5.4	14.8	270	312	395	456									
DC out-3	14:34	4.8	15.5	380	422	390	433									
DC out-2	14:44	5.3	15.1	900	1032	410	470									
DC out-1	14:54	6.2	13.9	200	243	425	517									
Scrubber	15:05	6.6	13.3	240	300	385	481									
Comp 4,5,7	15:17	5.5	14.9	150	174	470	546									
Comp 4,5,7	15:38	5.0	15.4	170	191	470	524									
Comp 1,2,3	15:48	5.2	14.9	225	256	450	513									
Scrubber		6.15	13.0	230	274	405	491									

AVERAGES

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO unc	CO cor	NO unc	NO cor	NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
BLR out		5.2	15.0		214		497									
DC out		5.4	14.8		545		483									
Econ out		6.4	13.2		290		486									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA A

TEST NO 34 A & B

DATE 10-29-77

FUEL Consolidation

LOAD 76 %

CONDITIONS 10.5" of A [Test SASJ, SO_x Part]

DATA TAKEN BY

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Scrubber	11 35	5.9	15.3	740	882	222	265									
4-7	11 45	5.15	17.1	320	363	277	315									
4	12 00	5.45	16.4	150	174	290	336									
5	12 15	5.25	17.5	500	571	262	299									
7	12 25	4.8	18.4	600	667	235	261									
Scrubber	12 45	6.7	14.0	340	428	235	296									
4	13 00	5.9	15.9	510	608	295	352									
4,5,7	13 15	6.05	15.7	255	307	310	373									
7	13 30	6.3	14.8	110	135	280	343									
6	13 45	5.8	16.2	100	118	265	314									
4-7	13 55	6.4	15.1	110	136	270	333									
1-3	14 15	6.2	15.6	80	97	280	341									
Scrubber	14 40	7.2	13.3	100	130	220	287									
4-7	14 45	6.25	15.4	80	98											
Scrubber	15 10	6.9	13.9	110	140	300	383									
4-7	15 40	6.05	16.6	120	144	325	391									
4-7	16 05	6.45	15.1	115	142	350	433									
4	16 20	6.9	13.7	150	191	360	460									
5	16 35	6.25	15.1	210	256	345	421									
6	16 45	5.5	16.1	320	372	310	360									
7	17 00	5.4	15.6	425	490	275	317									
4-7	17 20	5.85	15.4	280	337	290	345									
4-7	AVE	5.86	15.9	252	300	297	353									Average
Scrubber	AVE	6.5	14.4	389	483	254	315									Average

AVERAGES

Blr out		5.86	15.9		300		353									
Econ out		6.5	14.4		483		315									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA A
TEST NO 35
DATE 10-30-77

FUEL Consolidation
LOAD 76 %
CONDITIONS 5" OFA [Sass Sox Part]
DATA TAKEN BY

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
4	13[10]	6.6	12.4	240	300	345	431									
5	13[25]	6.9	11.6	370	472	390	498									
7	13[40]	6.0	12.3	240	288	350	420									
Scrubber	14[10]	6.5	11.6	210	261	310	385									
4-7	14[20]	5.85	13.0	190	226	340	404									
4-7	14[40]	5.9	12.9	260	310	310	369									
Scrubber	15[50]	6.2	12.3	180	219	335	407									
6-7	16[01]	5.4	13.8	190	219	345	398									
7	16[20]	5.4	13.9	470	542	300	346									
6	16[30]	5.6	13.6	210	245	320	374									
1-3	16[45]	5.9	13.3	210	250	320	381									
4	16[55]	6.35	12.3	210	258	290	356									
Scrubber	17[05]	6.5	11.6	200	248	285	354									
4 6 7	17[20]	5.85	13.2	260	309	300	356									
4-7	17[31]	5.85	13.3	230	273	325	386									

AVERAGES

BLR out		5.97	12.94		313		394									
OC out		5.9	13.3		250		381									
Scrubber		6.4	11.85		243		382									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A
TEST NO 36
DATE 11/1/77

FUEL Consolidation Coal
LOAD 80%
CONDITIONS W/o reinjection
DATA TAKEN BY J.O.B.

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
BLROT-7	10:52	5.6	14.5	260	304	340	397									
BLROT-6	11:03	4.8	16.8	1040	1156	315	350									
BLROT-5	12:49	4.2	18.0		>2000	240	311									
SCRN OUT	13:00	5.6	14.8		>2000	275	320									
BLR OUT (Grid 4-7	13:05	4.3	17.5		>2000	295	318									

AVERAGES

BLR OUT		4.7	16.7		>2000		344									
SCRN OUT		5.6	14.8		>2000		320									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A

TEST NO 37

DATE 11/1/77

FUEL Consolidation Coal

LOAD 87%

CONDITIONS With reinjection

DATA TAKEN BY J.O.B.

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
COMB 4-7	14:47	4.65	17.5	1270	1398	305	336									
BLR OUT-4	14:58	5.0	15.7	100	113	315	354									
BLR OUT-5	15:09	4.3	17.9		72000	300	323									
BLR OUT-6	15:18	4.75	13.6	220	346	310	335									
BLR OUT-7	15:37	4.75	16.8	300	332	350	388									
Econ out	15:50	5.45	15.0	230	257	310	364									
BLR OUT-5	16:00	4.7	17.1	240	265	360	398									
COMP 4-7	16:11	5.95	12.0	80	96	265	317									
Stack	16:30	5.5	15.1	350	406	290	337									
COMP 4-7	16:42	6.05	11.4	210	251	245	295									
Econ out	16:55	5.2	14.9	340	387	290	330									
BLR OUT-7	17:10	5.0	15.4	470	524	335	377									

AVERAGES

BLR OUT		5.04	15.6		276		347									
Econ OUT		5.2	14.95		319		342									
Stack		5.5	15.1		406		337									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A — FUEL Consolidation Coal

TEST NO 38 — LOAD 59%

DATE 11/2/77 — CONDITIONS Maximum overfire air

DATA TAKEN BY J.O.B.

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry) unc	CO · ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
BLR OUT-7	11:30	4.5	14.4	40	44	245	322									
BLR OUT-6	11:45	3.6	16.0	35	36	295	305									
BLR OUT-4	12:00	5.6	14.0	60	58	270	316									
BLR OUT-5	12:15	4.1	15.7	80	85	282	300									
Flue out	12:37	2.4	12.4	50	66	235	311									
Comp 4-7	12:45	5.5	14.5	70	91	277	322									

AVERAGES

BLR OUT		4.7	15.0		61		313									
Flue out		2.4	12.4		66		311									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A

TEST NO 39

DATE 11/2/77

FUEL Consolidation Coal

LOAD 60%

CONDITIONS 3" O.F.A.

DATA TAKEN BY JEC.

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry) unc	CO · ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp 4-7		4.3	15.1	480	517	280	302									
BLR out-5	15:45	4.5	14.8	1240	1407	270	295									
BLR out-6	16:00	4.2	16.0	1100	1174	290	311									
BLR out-7	16:10	5.5	14.2	50	54	330	353									
BLR out-4	16:35	5.6	14.2	40	47	300	351									→ leader chain
Gun out	16:40	6.4	13.3	930	1134	270	333									broken around
Comp 5-7	16:05	3.8	16.9		>2000	310	324									this point

AVERAGES

BLR out		4.9	14.8		670		335									
Gun out		6.4	13.3		1134		333									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE A

TEST NO 40

DATE 11/11/77

FUEL Kemmerer

LOAD 66%

CONDITIONS as found

DATA TAKEN BY J.E.C.

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Comp 4-7	10:42	7.0	12.8	80	103	395	508									
# 4	11:05	6.3	13.6	80	98	440	539									
# 5	11:15	7.0	12.8	80	103	425	546									
# 6	11:30	6.5	13.3	40	50	425	528									
# 7	11:45	6.5	12.8	92	114	400	497									
Scrubber Inlet	12:00 noon	7.8	11.6	92	125	370	505									
Comp 4-7	12:15	6.3	13.3	80	98	420	514									
Comp 1-3	12:45	7.2	12.8	110	143	460	600									
# 4	1:25	6.1	13.6	80	97	440	532									
# 5	1:40	6.3	13.2	90	110	400	490									
# 6	2:55	6.8	12.8	40	51	470	596									
# 7	3:10	7.0	12.4	122	157	390	501									
Scrubber Inlet	3:35	8.0	11.3	140	194	390	540									
4-7	4:05	7.4	12.3	90	119	420	556									
Scrubber	4:17	8.6	11.0	100	145	375	544									
# 4	4:41	7.3	12.2	105	138	415	545									
# 5	5:00	7.6	12.1	105	141	465	625									
# 6	5:10	5.8	13.6	40	47	470	557									
# 7	5:30	7.6	12.0	105	141	450	604									
4-7	5:42	8.1	11.6	105	147	430	600									

AVERAGES

Probe Position	Time	O_2	CO_2	CO unc	CO cor	NO unc	NO cor	NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
Boiler out		6.9	12.8	[illegible]	104	[illegible]	546									
Econ out		8.1	11.3	[illegible]	155	[illegible]	529									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

SOx DATA SUMMARY

Test No.	Load	O2 (%)	SO2 (unc ppm)	SO3 (unc ppm)	SOx (unc ppm)	SO2 (corr ppm)	SO3 (corr ppm)	SOx (corr ppm)	Test Description
1A	191,000	3.6	735	0	735	765	-0-	765	BASELINE
1B	"	3.6	760	7	767	791	8	799	BLR OUTLET,
1C	"	3.6	720	-0-	720	749	0	749	AS FOUND O_2
1AVE.	"	3.6	738	2	740	768	2	(771)	
8A	196,000	4.2	705	3.8	709	756	4	760	
8B	"	4.2	703	9.3	712	754	10	764	
8C	"	4.1	691	-0-	691	736	-0-	736	
AVE	"	4.2	700	4.4	704	749	4.7	(753)	
8D	156,000	7.6	230	0.35	230	309	0.5	310	
8E	"	8.6	208	-0-	208	302	-0-	302	
8F	"	8.6	208	-0-	208	302	-0-	302	
AVE	"	8.3	215	0.1	215	304	0.2	(305)	
9A	182,000	4.5	712	2.1	714	777	2.3	779	
9B	"	5.8	561	3.2	564	665	3.8	669	
9C	"	5.8	791	3.2	794	938	3.8	942	
AVE	"	5.4	688	2.8	691	793	3.3	(797)	
12A	141,000	5.76	650	1.6	652	769	1.9	771	
12B	"	5.4	648	4.5	653	748	5.2	753	
12C	"	5.36	735	5.6	741	852	6.4	858	
Ave	"	5.5	678	3.9	682	790	4.5	(794)	

SOx DATA SUMMARY

Test No.	Load	O2 (%)	SO2 (unc ppm)	SO3 (unc ppm)	SOx (unc ppm)	SO2 (corr ppm)	SO3 (corr ppm)	SOx (corr ppm)	Test Description
18A	138,000	6.8	677.3	7.72	684	860	9.8	870	
18B	"	7.0	695.1	9.51	705	894	12.2	906	
18C	"	6.9	706.96	5.94	713	903	7.6	911	
AVE.	"	6.9	693.1	7.72	701	886	9.9	(896)	
18D	138,000	8.7	225.4	2.2	228	330	4	334	
18E	"	8.2	202.6	3.28	206	285	5	290	
18F	"	"	230.0	4.38	234	323	6	329	
AVE	"	8.4	219.3	3.5	223	313	5	(318)	
20A	42%	5.5	1086	3.0	1089	1262	3.5	1266	
20B	"	6.0	882	10.0	892	1059	12.0	1071	
20C	"	6.55	752	12.6	765	938	16.0	954	
AVE	"	6.0	907	8.5	916	1086	10.5	(1097)	

156

8830-7

SOx DATA SUMMARY

Test No.	Load	O2 (%)	SO2 (unc ppm)	SO3 (unc ppm)	SOx (unc ppm)	SO2 (corr ppm)	SO3 (corr ppm)	SOx (corr ppm)	Test Description
34A	76%	6.0	429	9	438	515	11	526	BLR-OUT
34B	"	6.4	430	6	436	530	8	538	
34	"	6.2	385	8	393	468	10	478	
AVE	"	6.2	415	8	422	504	10	514	
34D	"	6.4	594	10	604	732	12	744	ESP OUT
34E	"	6.6	388	8	396	484	10	494	
34F	"	6.8	373	11	384	473	14	487	
AVE	"	6.6	452	10	461	563	12	575	
35A	76%	6.0	336	7	343	404	8	412	BLR OUT
35B	"	5.85	344	5	349	408	6	414	
35C	"	6.0	348	6	354	417	7	424	
AVE	"	5.95	343	6	349	410	7	417	
35D	"	6.4	285	0	285	352	0	352	ESP OUT
35E	"	6.5	284	3	287	353	4	357	
35F	"	6.4	288	2	290	355	3	358	
AVE	"	6.47	286	2	287	353	2	356	

8830-7

Local ABMA - SITE A

SOx DATA SHEET

Date 8-9-77 Probe Location & Probe Length 2.5' mech. out

Unit # 2 Fuel STANSBURY COAL Load 59%

Test Description:

Test No.	Box No.	Sample Time	Meter Temp. (T)	Meter (p) Press.	Meter Reading	(p) Baro. Press.	Port	Purge Time	O2
1A	3	11:07	104	-0-	0.000	23.57	4	11:28	
		11:21	106	-0-	1.000			12:02	3.6
1B	2	11:35	107	-0-	0.000		↓	12:04	
		11:49	108	-0-	1.000			12:34	
1C	1	11:59	110	-0-	0.000		↓	13:05	
		12:15	111	-0-	1.000			13:40	

SAMPLED BY

TITRATED BY

	Test # 1A			Test # 1B			Test # 1C		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0094	.0092	.0094	(.0093)					
Dilution Factor F	10	1		10	1		10	1	
SPIKE ~~Blank~~ B	4.9								
	5.9								
	4.5								
Averages	5.1								
Ml. of Titrant A	18.7	3.5		18.5	6.3		17.7	5.0	
	18.5			19.1			18.6		
	18.8			19.6			18.7		
Averages	18.7	3.5		19.1	6.3		18.3	5.0	
460 + T	565			567			570		
Sample Vol. V	1ft³			1ft³			1ft³		
P + p									
A - B	13.6	-1.6		14.0	1.2		13.2	-.1	

$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$

$SO2 = \frac{(13.6)(.0094)(10)(565)24}{(1)(23.57)}$

SO2 = 735.4 SO3 = 0

$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO2 @ 3% O2 = 765
SO3 @ 3% O2 = 0
SOx @ 3% O2 = 765

$SO2 = \frac{(14.0)(.0094)(10)(567)24}{(1)(23.57)}$

SO2 = 759.8

$SO3 = \frac{(1.2)(.0094)(1)(567)24}{(1)(23.57)}$

SO3 = 6.5

SO2 @ 3% O2 = 790.5
SO3 @ 3% O2 = 6.7
SOx @ 3% O2 = 797.2

$SO2 = \frac{(13.2)(.0094)(10)(570)24}{(1)(23.57)}$

SO2 = 720.2

$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO3 = 0

SO2 @ 3% O2 = 749.3
SO3 @ 3% O2 = 0
SOx @ 3% O2 = 749.3

Local ADMA - SITE A

SOx DATA SHEET

Date 8/20/77 Probe Location & Probe Length 2.5(+ Multiclone OUT

Unit # 1 Fuel STANSBURY COAL Load 65%

Test Description:

Test No.	Box No.	Sample Time	Meter Temp. (T)	(P) Meter Press.	Meter Reading	(p) Baro. Press.	Port	Purge Time	O2
9A	1	9:59	9	0	0.000	24.02	4	10:17	
		10:12	100		1.000			10:41	4.2
8B	3	10:31	101		0.000			10:48	"
		10:44	102		1.000			11:18	"
8C	2	11:04	103		0.000			11:22	4.1
		11:17	104		1.000			11:52	

SAMPLED BY

TITRATED BY

	Test # 9A			Test # 8B			Test # 8C		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.00979								
Dilution Factor F	10	1		.10	1		10	1	
SPIKE B	4.8								
	4.8								
	4.9								
Averages	4.833								
Ml. of Titrant A	17.8	4.9		17.8	5.0		17.4	4.8	
	17.7			17.6			17.3		
	17.7			17.5			17.4		
Averages	17.733			17.633			17.367		
460 + T	559			561.5			563.5		
Sample Vol. V	1.041			1.0			1.0		
P + p	24.02			24.02			24.02		
A - B	12.90	.07		12.80	.17		12.53	0	

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(12.9)(.00979)(10)(559)24}{(1)(24.09)}$$

SO2 = 705 SO3 = 3.9

$$SO3 = \frac{(.07)(\ )(\ )(559)24}{(\ )(\ )}$$

SO2 @ 3% O2 = 756
SO3 @ 3% O2 = 4
SOx @ 3% O2 = 760 ppm

$$SO2 = \frac{(12.9)(\ )(\ )(561.5)24}{(\ )(\ )}$$

SO2 = 703

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 9.7

SO2 @ 3% O2 = 754
SO3 @ 3% O2 = 10
SOx @ 3% O2 = 764

$$SO2 = \frac{(12.57)(\ )(\ )(561.5)24}{(\ )(\ )}$$

SO2 = 641

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 0

SO2 @ 3% O2 = 736
SO3 @ 3% O2 = 0
SOx @ 3% O2 = 736

Local ABMA - SITE A

SOx DATA SHEET

Date 8/20/77 Probe Location & Probe Length 2.5ft. Stack

Unit # 1 Fuel Stansbury Coal Load 52%

Test Description:

Test No.	Box No.	Sample Time	Meter Temp.(T)	(P) Press.	Meter Reading	(p) Baro. Press.	Port	Purge Time	O2
8D	1	14:23	84	-0-	0.000	23.92	SE stack		
		14:39	84		1.000				7.6
8E	3	14:52	86		0.000				
		15:06	86		1.000				7.6
8F	2	15:21	85		0.000				
		15:34	86		1.000				

SAMPLED BY

TITRATED BY

	Test # 8D			Test # 8E			Test # 8F		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.00979								
Dilution Factor F	10			10			10		
Blank B	0	SPLKR		0			0		
Averages		4.833			4.833			4.833	
Ml. of Titrant A	4.3 4.3 —	4.9		3.8 3.9 3.9	4.8		3.8 3.9 3.9	4.8	
Averages	4.3			3.87			3.87		
460 + T	544			546			54.		
Sample Vol. V									
P + p	23.92			23.92			23.92		
A - B	4.3	0		3.87	0		3.87	0	

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(4.3)(.00979)(10)(544)24}{(1)(23.92)}$$

SO2 = 230 SO3 = .25

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 @ 3% O2 = 309

SO3 @ 3% O2 = .5

SOx @ 3% O2 = 310

$$SO2 = \frac{(3.87)(\ )(\ )(546)24}{(\ )(\ )}$$

SO2 = 208

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 0

SO2 @ 3% O2 = 302

SO3 @ 3% O2 = 0

SOx @ 3% O2 = 302

$$SO2 = \frac{(\ )(\ )(\ )(546)24}{(\ )(\ )}$$

SO2 = 208

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 0

SO2 @ 3% O2 = 302

SO3 @ 3% O2 = 0

SOx @ 3% O2 = 302

Local ABMA - SITE A

Load unsteady

SOx DATA SHEET

Date 8/23/77 Probe Location & Probe Length 2.5' BLR OUT

Unit # 1 Fuel STANSBURY COAL Load 61%

Test Description: Only SO_3 samples were spiked

Test No.	Box No.	Sample Time	Meter Temp. (T)	(P) Meter Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
9A	1	14:10	101	-0-	0.000	23.44	4	14:25	
		14:23	102		1.000			14:35	4.5
9B	3	14:35	105		0.000			14:55	
		14:48	105		1.000			14:25	5.8
9C	2	15:02	104		0.000			14:25	
		15:16	104		1.000				

SAMPLED BY

TITRATED BY

	Test # 9A			Test # 9B			Test # 9C		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N									
Dilution Factor F	10	1		10	1		10	1	
~~Blank~~ Spike B		4.1							
		4.3							
		4.3							
Averages		4.23							
Ml. of Titrant A	12.7	4.6		10.0	4.8		14.0	4.8	
	12.6			9.9			14.0		
				9.8			14.0		
Averages	12.65	4.6		9.9	4.8		14.0	4.8	
460 + T	561.5								
Sample Vol. V	1.000	→		→			→		
P + p	23.44	→		→			→		
A - B	12.65	0.37		9.9	0.57		14.0	0.57	

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(12.65)(.00479)(10)(561.5)24}{(1.0)(23.44)}$$

SO2 = 712 SO3 = 2.1

$$SO3 = \frac{(.37)(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 @ 3% O2 = 777
SO3 @ 3% O2 = 2.3
SOx @ 3% O2 = 779

$$SO2 = \frac{(9.9)(.00479)(10)(565)24}{(1.0)(23.44)}$$

SO2 = 561

$$SO3 = \frac{(.57)(\ )(\ )(565)24}{(\ )(\ )}$$

SO3 = 3.2

SO2 @ 3% O2 = 664.6
SO3 @ 3% O2 = 3.8
SOx @ 3% O2 = 669

$$SO2 = \frac{(14.0)(.00479)(10)(564)24}{(1.0)(23.44)}$$

SO2 = 791

$$SO3 = \frac{(.57)(\ )(\ )(564)24}{(\ )(\ )}$$

SO3 = 3.2

SO2 @ 3% O2 = 938
SO3 @ 3% O2 = 3.9
SOx @ 3% O2 = 942

Local ABMA SITE A

SOx DATA SHEET

Date 8/24/77 Probe Location & Probe Length 2.5ft. MECH. OUT

Unit # 1 Fuel STANSBURY COAL Load 41%

Test Description: #12

Test No.	Box No.	Sample Time	Meter Temp. (T)	Meter (p) Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
12A	2	15:52	96	-0-	0.000	23.81	4	15:10	5.1 / 5.8
		15:05	96		1.000			15:40	5.7
12B	1	15:17	97		0.000			15:45	5.5 / 5.6
			97		1.000			16:15	5.1
12C	3	15:42	93		0.000			16:15	5.4 / 5.6
		15:55	92	↓	1.000	↓	↓	16:45	5.1

SAMPLED BY

TITRATED BY

	Test #12A			Test #12B			Test #12C		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0100								
Dilution Factor F	10	1		10	1		10	1	
~~SPIKE~~ Blank B		6.3							
		6.4							
		6.3							
Averages		6.3							
Ml. of Titrant A	11.7	6.6		11.4	7.1		13.2	7.3	
	11.6			11.6			13.1		
	11.6			11.6			13.2		
Averages	11.6	6.6		11.53			13.2		
460 + T	556			557					
Sample Vol. V	1.000								
P + p	23.81								
A - B		.3			0.8			1.0	

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(11.6)(.01)(10)(556)24}{(23.8)(1)}$$

SO2 = 650 SO3 = 1.6

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 @ 3% O2 = 764.5
SO3 @ 3% O2 = 1.85
SOx @ 3% O2 = 771

$$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 = 647.5

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 4.5

SO2 @ 3% O2 = 748
SO3 @ 3% O2 = 5.2
SOx @ 3% O2 = 753

$$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 = 735.1

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 5.56

SO2 @ 3% O2 = 852
SO3 @ 3% O2 = 6.4
SOx @ 3% O2 = 858

Local ARMA-SITE A

SOx DATA SHEET

Date 9/11/77 Probe Location & Probe Length 2.5' ESP Inlet

Unit # 1 Fuel Stansbory Coal Load 48%

Test Description:

Test No.	Box No.	Sample Time	Meter Temp. (T)	Meter (P) Press.	Meter Reading	(p) Baro. Press.	Port	Purge Time	O2
18A	3	11:23	107	-0-	0.000	23.78	4	11:42	
			107		1.000			12:12	6.8
18B	1	11:58	107		0.000			12:15	
			106		1.000			12:45	7.0
18C	2	12:27	106		0.000			12:45	
			106		1.000			13:15	6.9

SAMPLED BY

TITRATED BY

	Test #18A			Test #18B			Test #18C		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0104								
Dilution Factor F	10	1		10	1		10	1	
~~Blank~~ Spike B		6.6							
		6.7							
Averages		6.6							
Ml. of Titrant A	11.5	7.9		11.7	8.2		12.0	7.6	
	11.2			11.8			11.8		
	11.4			11.7			11.9		
Averages	11.4	7.9		11.7	8.2		11.9	7.6	
460 + T	566			566			566		
Sample Vol. V	1 ft³			1 ft³			1 ft³		
P + p	23.78			23.78			23.78		
A - B	—	1.3		—	1.6		—	1.0	

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(11.4)(.0104)(10)(566)24}{(1)(22.78)}$$

SO2 = 677.3 SO3 = 7.72

$$SO3 = \frac{(1.3)(.0104)(1)(566)24}{(1)(22.78)}$$

SO2 @ 3% O2 = 860
SO3 @ 3% O2 = 9.8
SOx @ 3% O2 = 870

$$SO2 = \frac{(11.7)(.0104)(10)(566)24}{(1)(23.78)}$$

SO2 = 695.1

$$SO3 = \frac{(1.6)(.0104)(1)(566)24}{(1)(23.78)}$$

SO3 = 9.51

SO2 @ 3% O2 = 894
SO3 @ 3% O2 = 12.2
SOx @ 3% O2 = 906

$$SO2 = \frac{(11.9)(.0104)(10)(566)24}{(1)(23.78)}$$

SO2 = 706.96

$$SO3 = \frac{(1.0)(.0104)(1)(566)24}{(1)(23.78)}$$

SO3 = 5.94

SO2 @ 3% O2 = 902
SO3 @ 3% O2 = 7.6
SOx @ 3% O2 = 914

Local ADMA - SITE A

SOx DATA SHEET

Date 9/11/77 Probe Location & Probe Length 2.5' Stack

Unit # 1 Fuel Sta-sbury Coal Load 48%

Test Description:

Test No.	Box No.	Sample Time	Meter Temp.(T)	Meter (P) Press.	Meter Reading	(p) Baro. Press.	Port	Purge Time	O2
18D	2	16:10	63	-0-	0.000	23.75	SF Stack		8.7
		16:23	62		1.000				
18E	3	16:42	61		0.000				
		16:57	61		1.000				8.2
18F	1	17:09	61		0.000				
		17:22	61		1.000				

SAMPLED BY

	Test #18D			Test #18E			Test #18F		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0104								
Dilution Factor F	10	1		10	1		10	1	
Spike / ~~Blank~~ B		6.5 6.6 6.6							
Averages		6.6							
Ml. of Titrant A	4.0 4.1 4.3	7.0		3.7 3.8 —	7.2		4.3 4.1 4.2	7.4	
Averages	4.1			3.7			4.2		
460 + T	523			521			521		
Sample Vol. V	1ft³								
P + p	23.75								
A - B	—	0.4		—	0.6		—	0.8	

TITRATED BY

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(4.1)(.0104)(10)(523)24}{(1)(23.75)}$$

SO2 = 225.4 SO3 = 2.2

$$SO3 = \frac{(0.4)(.0104)(1)(523)24}{(1)(23.75)}$$

SO2 @ 3% O2 = 330
SO3 @ 3% O2 = 4
SOx @ 3% O2 = 334

$$SO2 = \frac{(3.7)(.0104)(10)(521)24}{(1)(23.75)}$$

SO2 = 202.6

$$SO3 = \frac{(0.6)(.0104)(1)(521)24}{(1)(23.75)}$$

SO3 = 3.28

SO2 @ 3% O2 = 285
SO3 @ 3% O2 = 5
SOx @ 3% O2 = 290

$$SO2 = \frac{(4.2)(.0104)(10)(521)24}{(1)(23.75)}$$

SO2 = 230.0

$$SO3 = \frac{(0.8)(.0104)(1)(521)24}{(1)(23.75)}$$

SO3 = 4.37

SO2 @ 3% O2 = 323
SO3 @ 3% O2 = 6
SOx @ 3% O2 = 329

Local ABMA SITE A

SOx DATA SHEET

Date 9/14/77 Probe Location & Probe Length 25ft 0ft

Unit # 1 Fuel Kemmerer coal Load 245% Low O_2

Test Description: meter corr. factor = 1.03

Test No.	Box No.	Sample Time	Meter Temp. (T)	(p) Meter Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
20A		START	105	-0-	0.000	23.86	#4		5.6%
		FINISH	105		1.000				5.4%
20B		S	110		0.000				6.0%
		F	111		1.000				6.0%
20C		S	111		0.000				6.3%
		F	111		1.000				6.8

SAMPLED BY

	Test #204 SO2	SO3	SOx	Test #20B SO2	SO3	SOx	Test #20C SO2	SO3	SOx
Normality N	.0141								
Dilution Factor F	10	1		10	1		10	1	
SPIKE / ~~Blank~~ B		6.2 6.2							
Averages		6.2							
Ml. of Titrant A	13.8 14.0 14.1	6.8		11.1 11.6 11.0	7.5		9.5 9.6 9.6	7.8	
Averages	13.96	6.8		11.23	7.5		9.57		
460 + T	565			570.5			571		
Sample Vol. V	1.03								
P + p	23.96								
A - B	—	0.4		—	1.3		—	1.6	

TITRATED BY

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(13.96)(.0141)(10)(565)24}{(1.03)(23.96)}$$

SO2 = 1086 SO3 = 3.0

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 @ 3% O2 = 1262
SO3 @ 3% O2 = 3.5
SOx @ 3% O2 = 1265

$$SO2 = \frac{(11.23)(.0141)(10)(570.5)24}{(1.03)(23.96)}$$

SO2 = 882

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 10

SO2 @ 3% O2 = 1054
SO3 @ 3% O2 = 12
SOx @ 3% O2 = 1071

$$SO2 = \frac{(9.57)(.0141)(10)(571)24}{(1.03)(23.96)}$$

SO2 = 752

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 12.6

SO2 @ 3% O2 = 938
SO3 @ 3% O2 = 16
SOx @ 3% O2 = ~~954~~

Local ABMA SITE A

SOx DATA SHEET

Date 10/29/77 Probe Location & Probe Length 18' BLR OUT

Unit # 1 Fuel Consolidation Coal Load 80%

Test Description: SASS, SOx, Port 4 + out ESP Opt. Conditions

Test No.	Box No.	Sample Time	Meter Temp. (T)	(p) Meter Press.	Meter Reading*	(p) Baro. Press.	Port	Purge Time	O2
34A	1	13:04	87	-0-	0.000	23.62	4	13:30	6.0
		13:17	112		1.000			14:00	
34B	2	13:45	98		0.000			16:02	6.4
		13:56	116		1.000			16:31	
34C	3	14:32	100		0.000			14:53	
		14:46	113		1.000			15:22	6.2

SAMPLED BY

* meter corr. 1.014

	Test #34A			Test #34B			Test #34C		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0141								
Dilution Factor F	10	1		10	1		10	1	
		spike							
Blank B	.05	6.6							
Averages	.05	6.6							
Ml. of Titrant A	5.8	7.8		5.5	7.4		5.0	7.6	
	5.4			5.6			5.1		
	—			5.4			4.8		
Averages	5.6	7.8		5.5			4.91		
460 + T	559.5			567			566.5		
Sample Vol. V	1.036								
P + p	23.62								
A - B	—	1.2		—	0.8		—	1.0	

TITRATED BY

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 = 429.4 SO3 = 9.28

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 @ 3% O2 = 575
SO3 @ 3% O2 = 11
SOx @ 3% O2 = 526

$$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 = 429.9

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 6.31

SO2 @ 3% O2 = 530
SO3 @ 3% O2 = 8
SOx @ 3% O2 = 538

$$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 = 375.2

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 7.83

SO2 @ 3% O2 = 468
SO3 @ 3% O2 = 10
SOx @ 3% O2 = 478

Local ABMA - SITE A

Meter Correction = 1.036

SOx DATA SHEET

Date 10/29/77 Probe Location & Probe Length ESP OUT

Unit # 1 Fuel Consolidation Coal Load 76%

Test Description:

Test No.	Box No.	Sample Time	Meter Temp. (T)	(p) Meter Press.	Meter Reading	(p) Baro. Press.	Port	Purge Time	O2
34D	1	16:49	54	-0-	0.000	23.62	4	17:12	6.4
			53		1.036			17:42	—
34E	3	17:15	46		0.000			17:43	6.7
		17:29	46		1.036			18:13	6.5
34F	2	17:34	46		0.000				6.8
		17:47	46		1.036				

SAMPLED BY

	Test # 34D			Test # 34E			Test # 34F		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0141								
Dilution Factor F	10	1		10	1		10	1	
Blank B	0.4	SPIKE 6.7							
Averages									
Ml. of Titrant A	9.1 9.7 9.9	8.1		6.0 5.8 6.0	7.9		5.2 6.0 6.0	8.3	
Averages	8.76	8.1		5.93	7.9		5.73		
460 + T	513.5			506			506		
Sample Vol. V	1.036			1.03			1.036		
P + p	23.62								
A - B	.36	1.4		5.53	1.1		5.33	1.6	

TITRATED BY

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 = 5937 SO3 = 9.94

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 @ 3% O2 = 732
SO3 @ 3% O2 = 12
SOx @ 3% O2 = 744

$$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 = 387.2

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 7.70

SO2 @ 3% O2 = 484
SO3 @ 3% O2 = 10
SOx @ 3% O2 = 494

$$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO2 = 377.2

$$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$$

SO3 = 11.20

SO2 @ 3% O2 = 473
SO3 @ 3% O2 = 14
SOx @ 3% O2 = 487

Local ABMA - SITE A

Meter correction #1 1.036 #2 1.03

SOx DATA SHEET

Date 10-20-77 Probe Location & Probe Length 18" BLR OUT

Unit # 1 Fuel Consolidation Coal Load 80%

Test Description:

Test No.	Box No.	Sample Time	Meter Temp. (T)	Meter (P) Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
35A	1	13:55	97	-0-	0.000	23.62	4	14:17	6.0
		14:07	108		.000			14:48	
35B	2	14:25	65		0.000			14:51	5.85
		14:28	96		1.000			15:25	
35C	3	15:06	88		0.000			15:27	
		15:18	106		1.0			16:05*	6.0

SAMPLED BY

* Glassware separated during purge

	Test # 35A			Test # 35D			Test # 36C		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0141								
Dilution Factor F	10	1		10	1		10	1	
Blank B	0.1	SPIKE 6.7							
Averages									
Ml. of Titrant A	4.3	7.6		4.8	7.4		4.6	7.5	
	4.6			4.6			4.7		
	4.4			4.6			4.8		
Averages	4.4	7.6		4.7			4.7	7.5	
460 + T	562.5			540.5					
Sample Vol. V	1.03			1.036			1.056		
P + p	23.62								
A - B	4.3	0.9		4.6	0.7		4.6	0.8	

TITRATED BY

$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$

$SO2 = \frac{(4.3)(.0141)(10)(562.5)24}{(1.03)(23.62)}$

SO2 = 336.4 SO3 = 7.84

$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO2 @ 3% O2 = 404
SO3 @ 3% O2 = 8
SOx @ 3% O2 = 412

$SO2 = \frac{(4.6)(.0141)(10)(540.5)24}{(1.036)(23.62)}$

SO2 = 343.8

$SO3 = \frac{(0.7)(.0141)(1)(540.5)24}{(1.036)(23.62)}$

SO3 = 5.23

SO2 @ 3% O2 = 408
SO3 @ 3% O2 = 6
SOx @ 3% O2 = 414

$SO2 = \frac{(4.6)(.0141)(10)(55)24}{(1.06)(23.62)}$

SO2 = 347.7

$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO3 = 6.14

SO2 @ 3% O2 = 417
SO3 @ 3% O2 = 7
SOx @ 3% O2 = 424

Local ABMA - SITE A

SOx DATA SHEET

Date 10/30/77 Probe Location & Probe Length ESP OUT

Unit # 1 Fuel CONSOLIDATION COAL Load

Test Description:

Test No.	Box No.	Sample Time	Meter Temp. (T)	Meter (p) Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
35D	1	16:39	70	-0-	0.000	23.62	4		8.1
		16:54	53		1.030				—
35E	2	17:00	50		0.000				7.9
		17:14	44		1.030				7.9
35F	3	17:19	42		0.000				7.7
		17:32	39		1.030				7.7

SAMPLED BY

TITRATED BY

	Test #35D			Test #35E			Test #35F		
	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0141								
Dilution Factor F	10	1		10	1		10	1	
Blank B	0.2	Spike 6.7							
Averages		subtract same x 2							
Ml. of Titrant A	4.0 4.1 4.3	13.4		4.2 4.2 4.3	7.1		4.3 4.4 4.3	7.0	
Averages	4.13			4.23			4.53		
460 + T	521.5			507			500.5		
Sample Vol. V	1.030								
P + p	23.62								
A - B	3.93	0		4.03	0.4		4.13	0.3	

$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$

$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO2 = 285.3 SO3 = 0

$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO2 @ 3% O2 = 352
SO3 @ 3% O2 = 0
SOx @ 3% O2 = 352

$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO2 = 294.4

$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO3 = 2.82

SO2 @ 3% O2 = 353
SO3 @ 3% O2 = 4
SOx @ 3% O2 = 357

$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO2 = 287.8

$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO3 = 2.09

SO2 @ 3% O2 = 355
SO3 @ 3% O2 = 5
SOx @ 3% O2 = 358

SECTION 4.0

SPECIAL TESTS

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SMOKE SPOT DATA SHEET

TEST SITE A · [illegible]

TEST NO.	NO. PUMPS	READING	PARTICULATES lb/10^6BTU	COMBUSTIBLES %	COMBUSTIBLES lb/10^6BTU
21	1	30, 40	12.1830	72.1	8.1839
21	2	70, 60	12.1[illegible]	72.1	8.1839
22	1	60	[illegible]	58.4	9.7589
22	2	75	16.7105	58.4	9.7589
23	1	25, 20	[illegible]	43.7	5.1233
23	2	40, 40	11.7238	43.7	5.1233
24	1	25	8.4722	60.8	[illegible]
24	2	40	8.4722	60.8	5.1511
26	1	8[illegible]	9.8190	[illegible]	5.1[illegible]
26	[illegible]	[illegible]	9.8190	[illegible]	5.[illegible]
28	1	[illegible]	[illegible]	60.7	[illegible]
28	2	[illegible]	20.[illegible]	60.7	[illegible]
29	1	[illegible]	15.411	[illegible]	8.1160
29	2	[illegible]		[illegible]	[illegible]

15900

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. 14 — LOAD 72 %

TEST SITE A — % O_2 5.6

TEST DATE 8-26-77 — FUEL

SAMPLE LOCATION Multiclone Outlet — SPECIAL CONDITIONS AS FOUND

ρ_p - Density of particles 2.5 g/cm^3

μ - Viscosity of flue gas 2.57×10^{-4} poise

MW - Molecular wt. flue gas 29.47 g/g mole

ΔP_I - Pressure drop across impactor 24.7 in H_2O

Ps - Absolute stack pressure 23.54 in. Hg

Ts - Absolute stack temperature 930 °R

Q - Actual flow rate at stack conditions .0809 A^3/min (Ft)

Vn - Dry gas volume 1.7 SCF

Mn - Total particulate mass 25.2 mgm

Cn - Total concentration .229 grains/SCF

I - Percent isokinetics 113 %

Vs - Gas velocity 42.82 A/sec (Ft)

Dn - Nozzle diameter .076 in.

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
Dj - Jet Diameter, cm	——	.2434	.1755	.1375	.0930	.0726	——
Fj - Press. factor, n.d.	——	.0210	.0273	.0395	.0903	.3277	——
$D_{s,\overline{50}}$ Stokes diameter, µm	~ 7.0 ?	2.52	1.43	0.91	0.41	0.23	——
$D_{A,\overline{50}}$ Aerodynamic diameter, µm	?	4.15	2.42	1.59	0.77	0.45	——
$D_{AI,\overline{50}}$ Aerodynamic impaction diameter, µm	?	4.47	2.73	1.89	1.35	0.72	——
Mn - Particulate mass, mgm	14.5	5.4	3.2	3.4	0.3	0.2	0.2
% - Percent of Total	57.5	23.4	12.7	3.6	1.2	0.8	0.8
Cumulative percent	100.0	42.5	19.1	6.4	2.8	1.6	0.8
Cn - Concentration, grains/SCF	.1316	.0536	.0220	.0082	.0027	.0018	.0018
Cumulative concentration, grains/SCF	.2288	.0971	.0436	.0145	.0064	.0036	.0018

#15900

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 14 LOAD 72 %

TEST SITE A % O_2 5.6

TEST DATE 8-26-77 FUEL

SAMPLE LOCATION Multiclone Outlet SPECIAL CONDITIONS AS FOUND

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP .30/.25/.215 BAROMETRIC PRESS in. Hg, P_{bar} 23.80

GAS TEMP. °R, Ts 930 GAS STATIC PRESS in. H_2O 3.6

PITOT CORRECTION FACTOR, Cp .837 GAS STATIC PRESS in. Hg abs, Ps 23.54

MOLECULAR WT. FLUE GAS, MW 28 assumed

$$Vs = 85.48\ Cp\ \left(\frac{Ts\ \Delta P}{Ps\ MW}\right)^{\frac{1}{2}} = 46.55/42.49/39.41 \text{ ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, Dn .076

NOZZLE AREA ft^2, An 3.15×10^{-5} $An = \pi(Dn/24)^2$

$Qn = Vs\ An\ 60 = .0883/.0803/.0745\ ft^3/min$ at nozzle

$Qc = Qn \sqrt{\frac{530}{Ts}} = .0664/.0606/.0562\ ft^3/min$ corrected to calibration conditions

PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 20.3/17.2/15.0 in. H_2O

OPERATING VACUUM (corrected for static pressure of duct) 23.9/20.8/18.6* in. H_2O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (Vm)	METER TEMP (Tm)
INITIAL	5:04/5:14/5:35	0/0/0	88/88/89
FINAL	5:16/5:31/5:46	.6/.6/.5	—
Δ min	11.72/12.18/11.32	.6/.6/.5	548/548/549

$$I = \frac{1.667\ Ts\ Vm\ P_{bar}}{\theta\ Tm\ Vs\ Ps\ An\left(1-\frac{\%H_2O}{100}\right)} = \frac{110.1}{116.1}\ \% \quad 112.0$$

$\%\ H_2O = 9.3$ (assumed)

*actual operating vacuums were 34.0/27.2/23.8 but could not be maintained because of leaks in Brink causing vacuum to continually drop.

#15900

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BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. 14 LOCATION A

TEST DATE 8-26-77 ENGINEER R.A.P.

TEST DESCRIPTION Multiclone Outlet

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER + SCREEN
DATE WT.								
TARE WT.	1	0.3488	3.4092	3.2676	3.4934	3.4609	3.2983	2.0068
	2		3.4092	3.2675	3.4933	3.4609	3.2983	2.0068
	3		3.4091	3.2674	3.4932	3.4608	3.2983	2.0067
	4							
AVERAGE		0.3488	3.4092	3.2675	3.4933	3.4609	3.2983	2.0068

POST TEST WEIGHTS (GRAMS)

DATE WT.								
GROSS WT.	1	0.4133	3.4151	3.2707	3.4942	3.4612	3.2985	2.0070
	2							
	3							
	4							
AVERAGE		0.4133	3.4151	3.2707	3.4942	3.4612	3.2985	2.0070

NET TEST RESULTS (MGM)

NET WT.	14.5	5.9	3.2	0.9	0.3	0.2	0.2
PERCENT	57.5	23.4	12.7	3.6	1.2	0.8	0.8

TOTAL NET WEIGHT 25.2 mgm

#15900

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. 19 LOAD 44 %

TEST SITE A % O_2 6.8

TEST DATE 9-12-77 FUEL

SAMPLE LOCATION Multiclone Outlet SPECIAL CONDITIONS AS FOUND

Pp - Density of particles 2.5 g/cm^3

μ - Viscosity of flue gas 2.39×10^{-4} poise

MW - Molecular wt. flue gas 29.18 g/g mole

ΔP_I - Pressure drop across impactor 11.5 in H_2O

Ps - Absolute stack pressure 23.63 in. Hg

Ts - Absolute stack temperature 840 °R

Q - Actual flow rate at stack conditions .0475 ft^3/min

Vn - Dry gas volume NA SCF

Mn - Total particulate mass 21.7 mgm

Cn - Total concentration NA grains/SCF

I - Percent isokinetics NA %

Vs - Gas velocity 25.49 ft/sec

Dn - Nozzle diameter .077 in.

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
Dj - Jet Diameter, cm	—	.2434	.1755	.1375	.0430	.0726	—
Fj - Press. factor, n.d.	—	.0210	.0273	.0345	.0403	.3277	—
$Ds, \overline{50}$ Stokes diameter, μm	illegible	3.22	1.87	1.32	0.59	0.35	—
$D_{A, \overline{50}}$ Aerodynamic diameter, μm	?	5.24	3.10	2.07	1.05	0.65	—
$D_{AI, \overline{50}}$ Aerodynamic impaction diameter, μm	?	4.51	3.37	2.33	1.30	0.89	—
Mn - Particulate mass, mgm	12.6	3.3	3.6	1.3	0.5	0.2	0.2
% - Percent of Total	58.1	15.2	16.6	6.0	2.3	0.9	0.9
Cumulative percent	100.0	41.9	illegible	10.1	4.1	1.8	0.9
Cn - Concentration, grains/SCF	NA	illegible	illegible	illegible	illegible	illegible	illegible
Cumulative concentration, grains/SCF	NA	illegible	illegible	illegible	illegible	illegible	illegible

#15900

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 19 LOAD 44 ?

TEST SITE A % O_2 6.8

TEST DATE 9-12-77 FUEL

SAMPLE LOCATION Multiclone Outlet SPECIAL CONDITIONS AS FOUND

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP .10 BAROMETRIC PRESS in. Hg, P_{bar} 23.78

GAS TEMP. °R, Ts 840 GAS STATIC PRESS in. H_2O -2.0

PITOT CORRECTION FACTOR, Cp .837 GAS STATIC PRESS in. Hg abs. Ps 23.63

MOLECULAR WT. FLUE GAS, MW 28 assumed

$$Vs = 85.48\ Cp\ \left(\frac{Ts\ \Delta P}{Ps\ MW}\right)^{\frac{1}{2}} = 25.49 \text{ ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, Dn .077

NOZZLE AREA ft^2, An 3.234×10^{-5} $An = \pi(Dn/24)^2$

$Qn = Vs\ An\ 60 = .0415$ ft^3/min at nozzle

$Qc = Qn \sqrt{\frac{530}{Ts}} = .0393$ ft^3/min corrected to calibration conditions

PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 7.6 in. H_2O

OPERATING VACUUM (corrected for static pressure of duct) 9.6 * in. H_2O

ISOKINETICS DETERMINATION

* Brink was rated at a ΔP of 11.5 H_2O.

	SAMPLE TIME (θ)	METER READING (Vm)	METER TEMP (Tm)
INITIAL	—	0	117
FINAL	—	.907	
Δ	15.117 min.	out of service	537 °R

$$I = \frac{1.667\ Ts\ Vm\ P_{bar}}{\theta\ Tm\ Vs\ Ps\ An\left(1-\frac{\%H_2O}{100}\right)} = NA^{+}\ \%$$

+ Dry gas meter inoperative

#15900

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. 19 LOCATION A

TEST DATE 12 Sep 77 ENGINEER R.A.P.

TEST DESCRIPTION Multiclone Outlet

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.			7-4-77					
TARE WT.	1	0.4113	3.4090	3.2677	3.4936	3.4603	3.2973	0.0321
	2		3.4091	3.2676	3.4935	3.4603	3.2972	0.0322
	3		3.4091	3.2676	3.4936	3.4603	3.2973	0.0321
	4							
AVERAGE		0.4113	3.4091	3.2676	3.4936	3.4603	3.2973	0.0321

POST TEST WEIGHTS (GRAMS)

DATE WT.								
GROSS WT.	1	0.4234	3.4124	3.2712	3.4494	[illegible]	[illegible]	[illegible]
	2							
	3							
	4							
AVERAGE		0.4234	3.4124	3.2712	3.4494	3.4608	3.2975	0.0323

NET TEST RESULTS (MGM)

NET WT.	12.6	3.3	3.6	1.3	0.5	0.2	0.2
PERCENT	58.1	15.2	16.6	6.0	2.3	0.9	0.9

TOTAL NET WEIGHT 21.7 mgm

177

#15900

SASS GRAVIMETRICS
TEST SITE A

TEST #27

Sample	Pretest Weight (gms)	Post Test Weight (gms)	Net Weight (gms)
LPE #1	23.9247	50.6233	
Probe + 10 microns	23.9248	50.6233	
Cyclone Solids	23.9248	50.6237	
	23.9248	50.6237	26.6986
LPE #2	23.9383	25.4696	
3 microns cyclone	23.9383	25.4696	
Solids	23.9383	25.4698	
	23.9383	25.4697	1.5313
LPE #3	23.4086	24.1139	
1 micron cyclone	23.4086	24.1142	
Solids	23.4087	24.1144	
	23.4086	24.1142	0.7056
Filter #24	1.2846	1.6239	
	1.2842	1.6241	
	1.2841	1.6242	
	1.2843	1.6241	0.3398
Filter #25	1.2936	1.6701	
	1.2935	1.6702	
	1.2935	1.6702	
	1.2935	1.6702	0.3767

TEST 27 BOILER OUT:

	Net Weight, grams	
10 microns	26.6986	
3 microns	1.5313	9.96% below 10 microns
1 micron	0.7056	4.80% below 3 microns
filter	0.7165	2.42% below 1 micron
TOTAL	29.6520	

SITE A - SASS GRAVIMETRICS

TEST 34 BOILER OUT:

	Net Weight, grams	
10 microns	202.57333	
3 microns	14.00929	9.32% below 10 microns
1 micron	3.23020	3.05% below 3 microns
filter	3.57714	1.60% below 1 micron
Total	223.38996	

TEST 35 BOILER OUT:

	Net Weight, grams	
10 microns	42.24569	
3 microns	11.34526	24.06% below 10 microns
1 micron	1.54490	3.66% below 3 microns
filter	0.49162	0.88% below 1 micron
Total	55.62747	

TEST 34 ESP OUT:

	Net Weight, grams	
10 microns	0.27726	
3 microns	0.19750	75.52% below 10 microns
1 micron	0.43368	58.09% below 3 microns
filter	0.22424	19.80% below 1 micron
Total	1.13268	

TEST 35 ESP OUT:

	Net Weight, grams	
10 microns	0.05091	
3 microns	0.05568	82.18% below 10 microns
1 micron	0.11949	62.62% below 3 microns
filter	0.05940	20.79% below 1 micron
Total	0.28568	

SASS FILTERS PARTICULATE LAB WORKSHEET Cyclone Containers

TEST NO. 4C (Inlet, Outlet) LOCATION ABMA-SITE A

Date 11-11-77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
BOTTLE NO.		10μ cyclone	3μ cyclone	.1μ cyclone	Filter #30	Filter #31	FILTER #33
BEAKER NO.		1	2	3			
DATE WT.		11-12-77	11-12-77	11-12-77	11-12-77	11-12-77	
TARE WT.	1	23.9677	23.6245	23.9025	1.2508	1.2521	1.2575
	2	23.9678	23.6246	23.9022	1.2511	1.2525	1.2573
	3	23.9678	23.6246	23.9023	1.2512	1.2525	1.2575
	4	—	—	—	—	—	1.2506
AVG.		23.9678	23.6246	23.9023			1.2508

POST TEST WTS.

	1	48.2352	31.6816	26.9661	2.2129	2.0336	
	2	48.2348	31.6812	26.9659	2.2129	2.0337	
	3	48.2347	31.6813	26.9658	2.2124	2.0336	
	4	—	—	—	—	—	
AVG.		48.2349	31.6814	26.9659	2.2126	2.0336	
Δ WT.		24.2671	8.0568	3.0636	0.9614	0.7811	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn _____ mgm REMARKS: _____

Filter #33

1.2589

1.2589

1.2591

ml. XAD_2 Condensate

8830-5 rev.

SASS - CONTAINERS — TEST #40
— 10μ cyclone —

PARTICULATE LAB WORKSHEET

TEST NO. 40 (Inlet, Outlet) LOCATION ABMA - SITE A

Date 11-11-77 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		10μcyclone	10μcyclone	10μcyclone	10μcyclone	~~10μcyclone~~
BEAKER NO.		4	5	6	9	~~10~~
DATE WT.		11-12-77	11-12-77	11-12-77	11-12-77	~~11-12-77~~
TARE WT.	1	23.9057	23.6372	23.3062	23.7069	~~24.0360~~
	2	23.9062	23.6377	23.3068	23.7063	~~24.0359~~
	3	23.9063	23.6376	23.3068	23.7063	~~24.0358~~
	4	—	—	—		NOT
AVG.		23.9061	23.6375	23.3066	23.7065	USED

POST TEST WTS.

1	55.9844	52.4580	50.1788	62.3077	
2	55.9841	52.4585	50.1784	~~62.3075~~	
3	55.9841	52.4582	50.1784	62.3074	
4	—	—	—	—	
AVG.	55.9842	52.4585	50.1785	62.3075	
Δ WT.	32.0781	28.8210	26.8719	38.6010	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn _____ mgm REMARKS: _____

10μ cyclone — 150.6391
3μ " — 8.0568
1μ " — 3.0636
161.7595

8830-5 rev.

KVB, Incorporated
Minneapolis, MN
ES-0552 5299-01
December 5, 1977

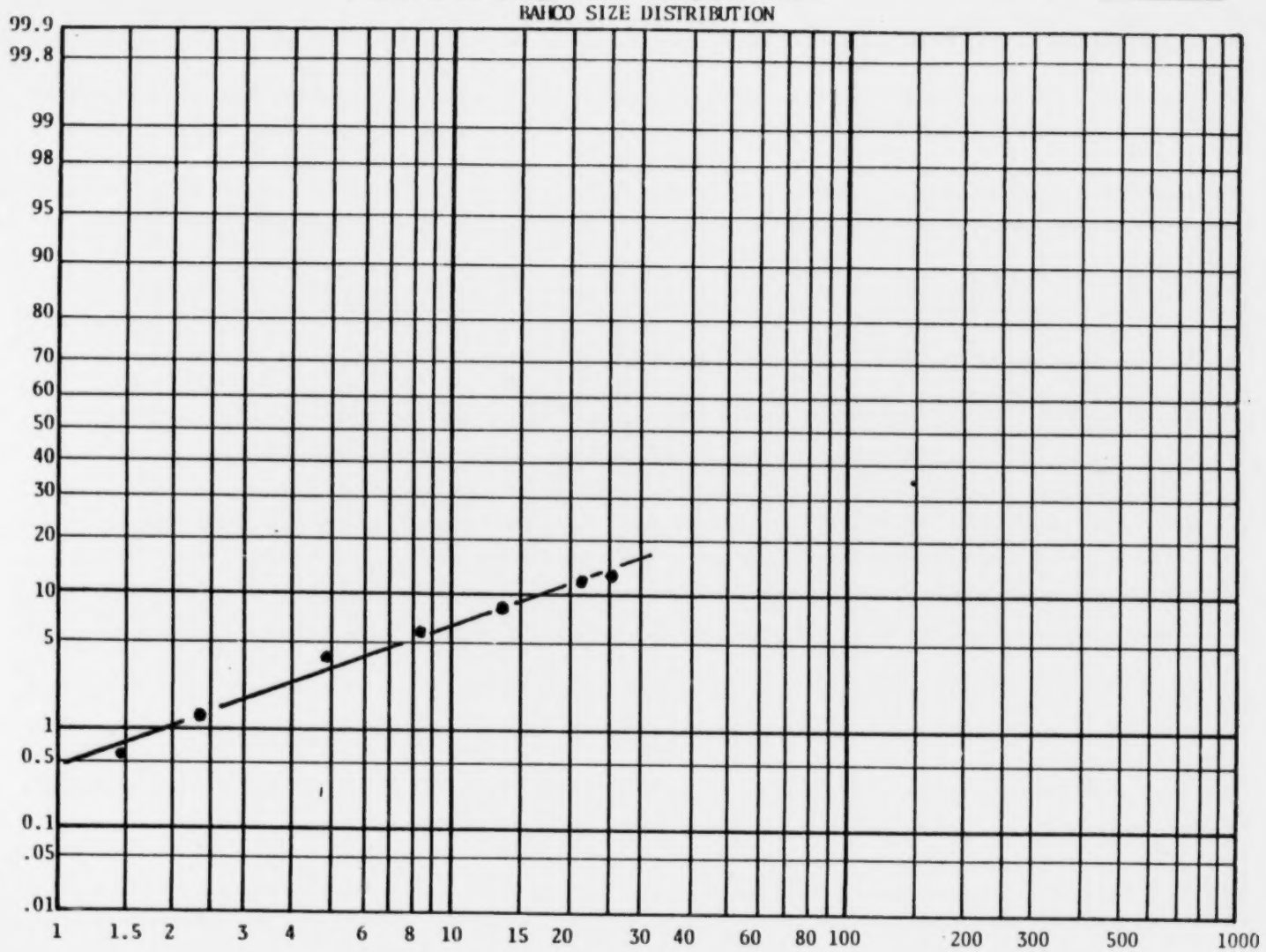
Sample No.	K-22126	K-22127
Sample Description	Ash Sample Test 31 ABMA Program	Multicone Ash Sample Test 32 Boiler A
Bahco Particle Size Determination		
% Through #100 (149 Microns)	35.3	28.9

Results: Terminal Velocity (In/Min.)	Diameter (Microns)	% Smaller	Diameter (Microns)	% Smaller
112.	25.	13.2	27.	22.8
79.0	21.	11.4	22.	21.0
31.0	13.	8.0	14.	15.3
12.3	8.3	5.6	8.8	8.5
4.15	4.8	3.9	5.1	4.0
0.96	2.3	1.6	2.5	1.4
0.35	1.4	0.6	1.5	0.5

Density, gms/cc (On #100 Mesh Material Only)	2.47	2.20

SAMPLE IDENTIFICATION ABMA Program
TEST #31, Ash Sample

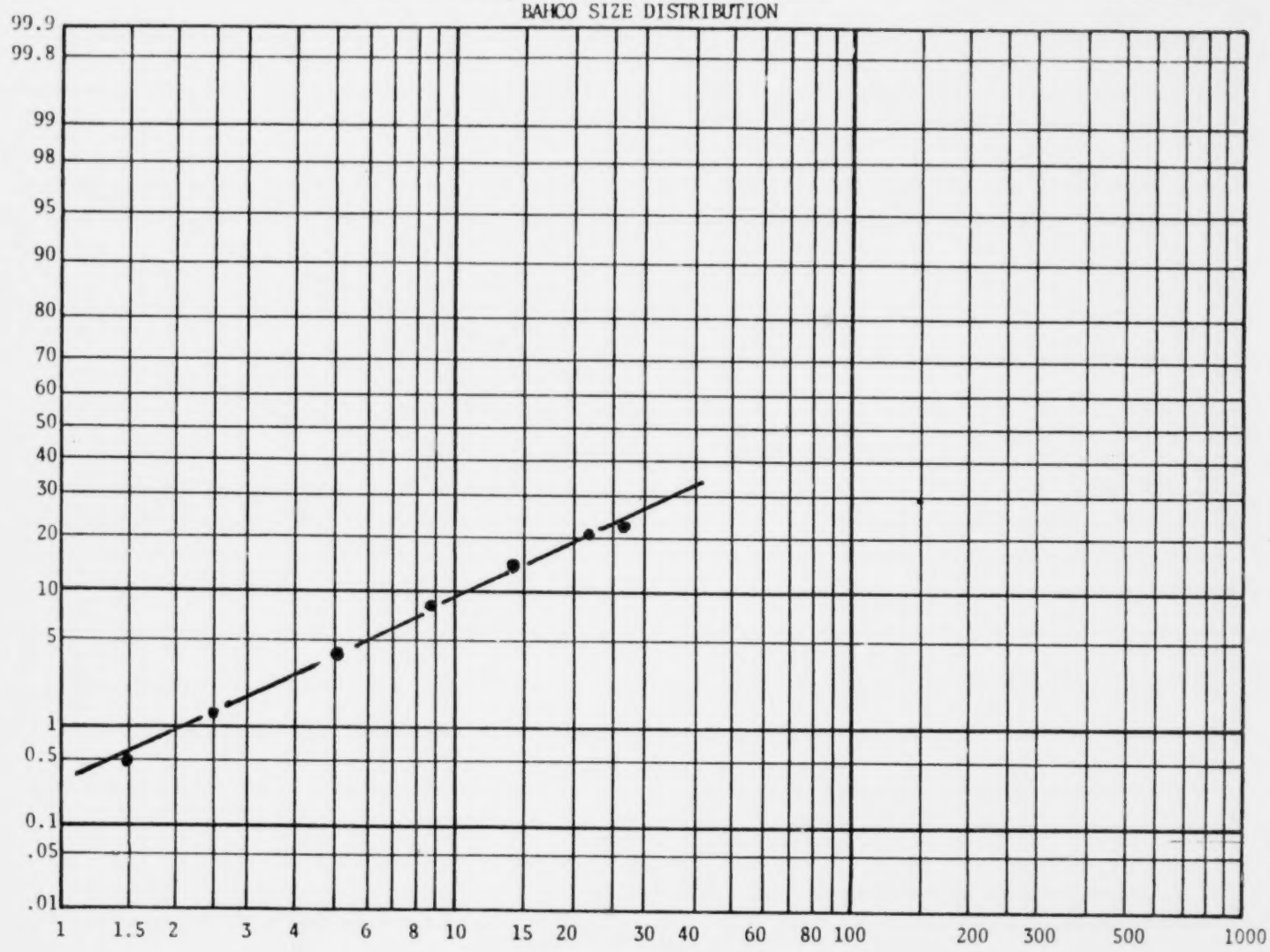
SAMPLE NO. K-22126
CHARGE NO. 5299-01



100m DENSITY 2.47 g/cc

SAMPLE IDENTIFICATION Multicone Ash Sample
TEST 32, Boiler A

SAMPLE NO. K-22127
CHARGE NO. 5299-01



100cm DENSITY 2.20 g/cc

COULTER COUNTER® Worksheet

SAMPLE

ELECTROLYTE Isoton DISPERSANT

EQUIPMENT TA II, sieves SERIAL

ORGANIZATION K.V.B.

OPERATOR M.B. DATE 12/14/77

Aper. Dia.	Ser. No.	CALIBRATION DATA	Part. Dia.	W	± I A	A
560	35932	MICROS.	42.87	8	3.2	143.3

± I A	3.2				
CALIB. A	172.5				
APERTURE DIA.	560				SAMPLE DATA

Geometric Mean μ^3	Volume μ^3	Diameter μ	Channel (W)				Test 31		Test 32		
			Relative channel width x			Dif. wt.% / x	Dif wt %	Cum wt %	Dif wt %/ x	Dif wt %	Cum wt %
.0231	.01636	.315									
.0462	.03272	.397									
.0925	.06545	.500									
.1851	.1309	.630									
.3702	.2618	.794									
.7405	.5236	1.00									
1.481	1.047	1.26									
2.962	2.094	1.59									
5.924	4.189	2.00									
11.85	8.378	2.52									
23.70	16.76	3.17									
47.39	33.51	4.00									
94.78	67.02	5.04									
189.6	134.0	6.35									
379.1	268.1	8.00									
758.3	536.2	10.08		1		1.1	1.1	100.0	1.9	1.9	100.0
1516.	1072.	12.7		1		1.3	1.3	98.9	2.4	2.4	98.1
3033.	2145.	16.0		1		1.3	1.3	97.6	2.7	2.7	95.7
6066.	4289.	20.2		1		1.7	1.7	96.3	3.2	3.2	93.0
12.13×10^3	8579.	25.4		1		2.5	2.5	94.6	3.7	3.7	89.8
24.27×10^3	17.16×10^3	32.0		1		3.5	3.5	92.1	3.5	3.5	86.1
48.54×10^3	34.31×10^3	40.3		1		4.3	4.3	88.6	2.9	2.9	82.6
97.18×10^3	68.63×10^3	50.8		1		5.8	5.8	84.3	2.3	2.3	79.7
194.4×10^3	137.3×10^3	64.0		1		5.4	5.4	78.5	2.2	2.2	77.4
388.7×10^3	274.5×10^3	80.6		1		5.4	5.4	73.1	1.8	1.8	75.2
777.4×10^3	549.0×10^3	101.6		1		5.1	5.1	67.7	1.4	1.4	73.4
1.555×10^6	1.098×10^6	128.		1		4.3	4.3	62.6	.4	.4	72.0
3.109×10^6	2.196×10^6	161.		1		5.5	5.5	58.3	0	0	71.6
6.219×10^6	4.392×10^6	203.		1		1.3	1.3	52.8	0	0	71.6
60 mesh		250		.75		8.9	6.7	51.5	2.1	1.6	71.6
50		300		1.5		3.8	5.7	44.8	1.9	2.8	70.0
40		420		.75		7.7	5.8	39.1	4.3	3.2	67.2
35		500		.75		10.8	8.1	33.3	7.9	5.9	64.0
30		595		1.5		8.2	12.3	25.2	8.0	12.0	58.1
20		840		.75		16.0	12.0	12.9	16.0	12.0	46.1
18		1000		2.25		.4	.9	.9	13.4	30.1	34.1
12		1680							4.0	4.0	4.0
10		2000									

2837A

COULTER COUNTER® Model T & TA — PARTICLE SIZE ANALYSIS

.15 - 200μ
A PERCENT

COULTER ELECTRONICS INC.
[illegible]
HIALEAH, FLA. 33616

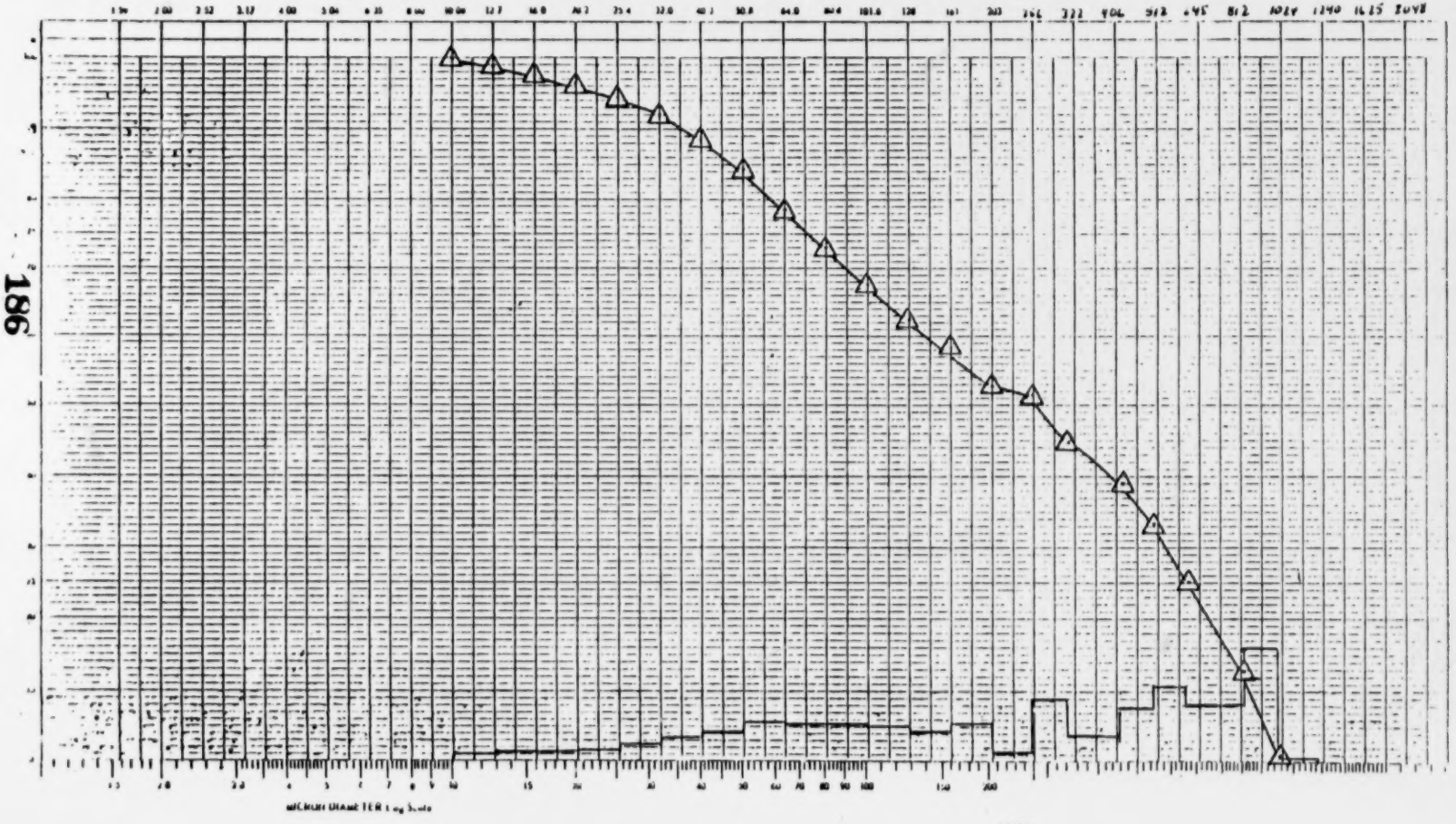
ORGANIZATION: KVB INCORPORATED

OPERATOR: M.B.

EQUIPMENT: TA II, sieves

$L = d\sqrt[3]{2\pi}$ — FOR MODEL T: $\frac{A_2}{A_1} = \left(\frac{d_2}{d_1}\right)^2$ when $W_2 = W_1$ — FOR MODEL TA: $\frac{A_2}{A_1} = \left(\frac{d_1}{d_2}\right)^2$ when $W_2 = W_1$

SAMPLE	ELECTROLYTE	DISPERSANT	APER. SIZE	SERIAL		PART DIA.	W	±1A	A	SAMPLE SETTINGS DIA.	W	±1A	A
Test 31	Isoton		560	35932	MICROSPHERES	43	8	3.2	143	43	8	3.2	172



2337B

COULTER COUNTER* Model T&TA

PARTICLE SIZE ANALYSIS

COULTER ELECTRONICS INC
590 W 20 ST.
HIALEAH, FLA. 33010

ORGANIZATION KVB INCORPORATED

OPERATOR M.B.

EQUIPMENT TA II, sieves

SAMPLE Test 32

ELECTROLYTE Isoton

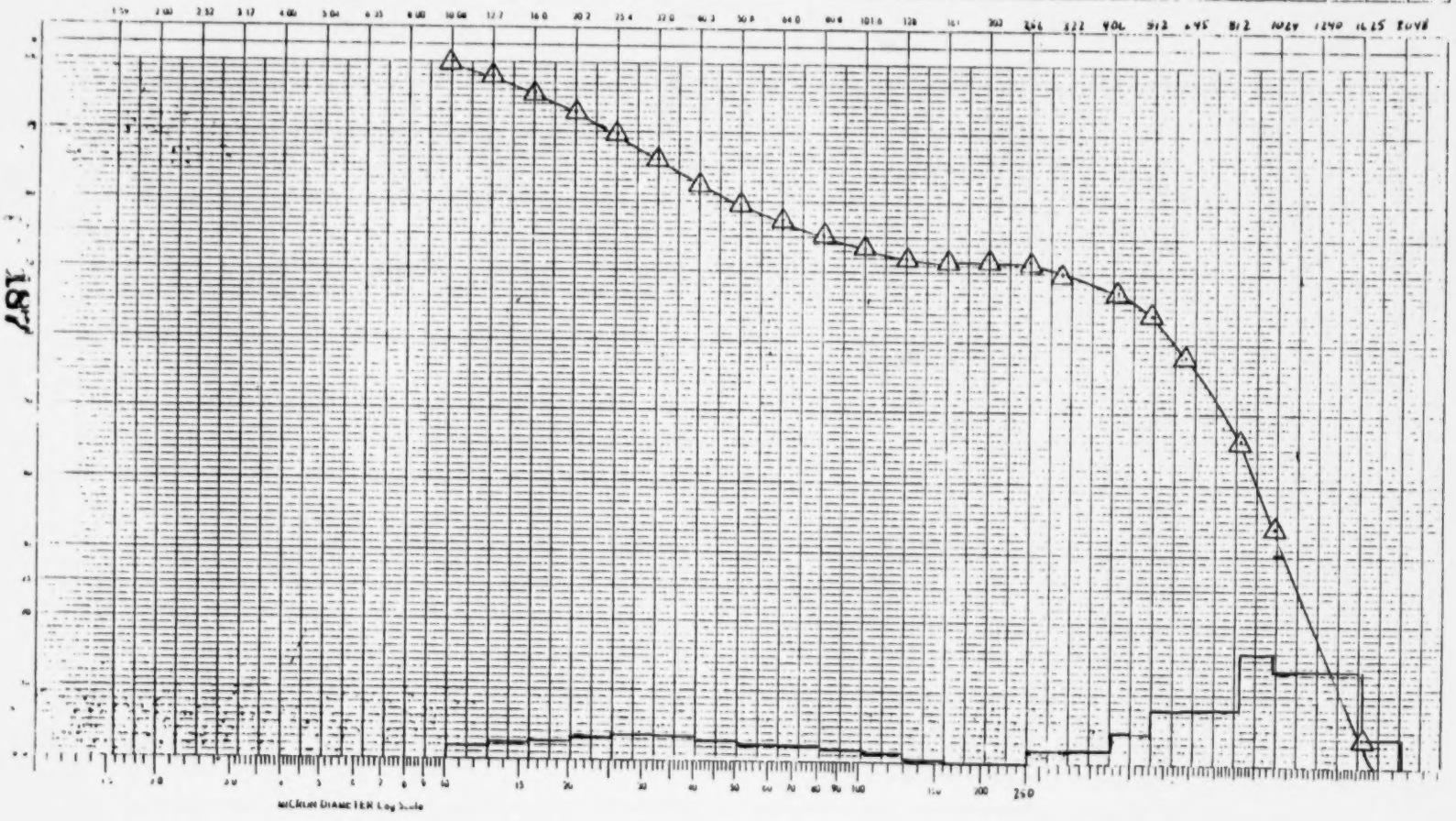
DISPERSANT

$L = d\sqrt[3]{P}$ FOR MODEL T

$\frac{A_2}{A_1} = \left(\frac{d_2}{d_1}\right)^3$ when $W_2 = W_1$

$\frac{A_2}{A_1} = \left(\frac{d_2}{d_1}\right)^2$ when $W_2 = W_1$ FOR MODEL TA

APER. SIZE	SERIAL		PART DIA	#	± %	A	SAMPLE SETTINGS DIA	#	± %	A
560	35932	MICROSPHERES	43	8	3.2	143	43	8	3.2	172



42210M

KVB

CORROSION PROBE DATA SHEET

SITE A DATE IN 8/8/77

PROBE PLACEMENT Connecting Section

COAL Stansbury, Kemmerer, Colorado

COUPON #	TARE WT, GM	DATE	FINAL WT, GM	WT LOSS, MG	DATE
19	31.1125 31.1127		31.0489 31.0489	(14 days) (4.6 mg/day)	9/11/77
AVG.	31.1126		31.0417	63.9	
20	31.5113 31.5115	31.4487 31.4488 31.4486	~~31.2268~~ ~~31.2268~~	(57 days) (11 mg/day)	11/14/77
AVG.	31.5115		31.4487	62.8	
21	30.4891 30.4894		30.3962 30.3966 30.3959	(45 days) (2.1 mg/day)	9/28/77
AVG.	30.4891		30.3963	92.8	
22			30.9872 30.9875	(14 days) (2.2 mg/day)	9/11/77
AVG.	31.0179		30.9875	30.4	
23	30.9789 30.9793		30.8780 30.8779 30.8778	(45 days) (2.3 mg/day)	9/28/77
AVG.	30.9791		30.8779	101.2	
24	31.2705 31.2705		31.2304 31.2304 31.2303	(80 days) (1.3 mg/day)	11/14/77
AVG.	31.2705		31.2304	102.9	
25	31.0752 31.0754		30.9379 30.9379 30.9381	(57 days) (2.41 mg/day)	11/14/77
AVG.	31.0753		30.9380	137.3	
26	31.2690 31.2690		31.2268 31.2268 31.2267	(80 days) (.53 mg/day)	
AVG.	31.2690		31.2268	42.2	11/14/77
27	30.9079 30.9081		30.7798 30.7798 30.7799	(32 days) (4.0 mg/day)	
AVG.	30.9080		30.7798	128.2	11/14/77

KVB

CORROSION PROBE DATA SHEET

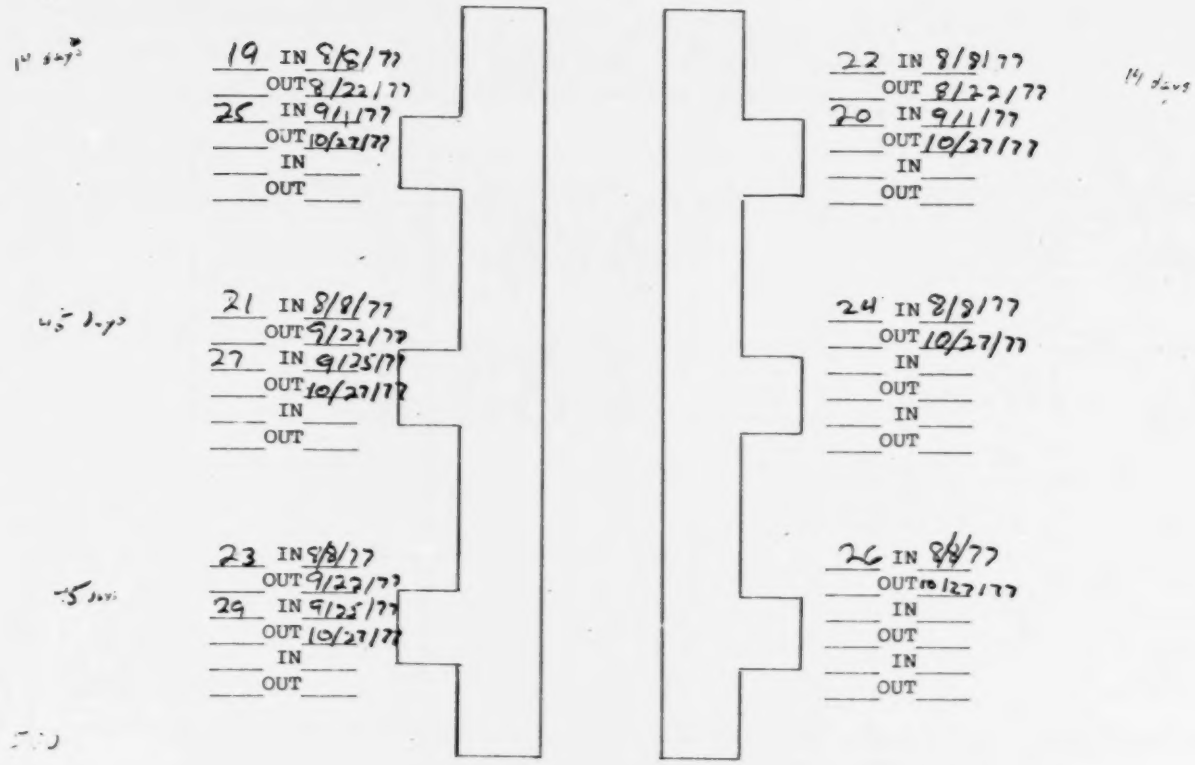
SITE A DATE IN 8-8-77

PROBE PLACEMENT Convective Section

COAL Stansbury, Kemmerer, Consolidation

COUPON #	TARE WT, GM	DATE	FINAL WT, GM	WT LOSS, MG	DATE
29	31.34162 31.3465		31.1176 31.1177 31.1177	(32 days) (7.1 mg/day)	
AVG.	31.3464		31.1177	228.7	11/14/77
30	31.3664 31.3663		31.3371 31.3372 31.3371	(80 days) (.4 mg/day)	Blank
AVG.	31.3664		31.3371	29.3	
31	30.7567 30.7566				
AVG.	30.7566				
32	31.3238 31.3236				
AVG.	31.3237				
33	31.3225 31.3225				
AVG.	31.3225				
34					
AVG.	31.1839				
35	30.4890 30.4892				
AVG.	30.4891				
36	31.2538 31.2536				
AVG.	31.2537				
37					
AVG.	30.5743				

Corrosion Coupon Locations
ABMA - Site A



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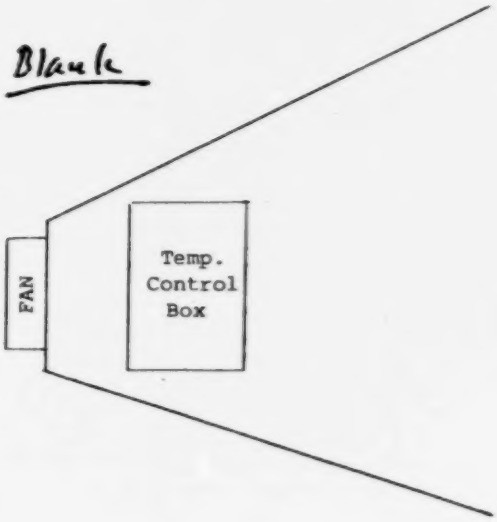

5th integrator

8/8/77	~ 266 370
8/22/77	~ 287130
9/1/77	~ 302630
10/27/77	~ 363660
9/22/77	~ 332870
9/25/77	~ 338200

#15900

CORROSION PROBE LOG

SITE A unit 1 DATE IN Aug 8, 77 @ 3:30 PM

PROBE PLACEMENT Convective Section

COAL Stansbury, Kemmerer, Colorado

DATE	PROBE TEMP.	PROBE VAC. ~~"H2O~~	BOILER LOAD	NOTES
8/8/77	650°F	-10 in H_g	140,000 I 25,00	Installed @ 3:30 pm Convective Section
8/9/77	750°F	-7.5 in H_g	180,000	Fan on 100%
8/11/77	830°F	-7.5 "H_g	"	"
8/22/77	770°F	-7.5 "H_g	"	Probe Removed from furnace
~~8/25/77~~				T/C Broken at tip
9/25/77				530 ml Dowtherm Removed
				Capens #22 & #19 removed
				Installed #20 & 25#
8/29/77	7900°F	-10 "H_g	180,000	T/C rewelded back on Tip
				Leak checked at 40psig. 550 ml
				Dowtherm added reinsulated
				Reinstalled in Convective Sect.
				Probe overheated, Removed
9/1/77	700°F	-10 in H_g	200,000	Rewelded T/C into Groove
				in Probe Tip. Reinsulated &
				reinstalled probe. Seems to
				work well w/ new T/C weld
				Fan making noise
9/2/77	700°F	-10 in H_g	180,000	Fan making noise but probe works
9/9/77	750°F	"	240,000	Fan failed over Holiday but
				Probe did not overheat
				Fan replaced

ABMA #15900

CORROSION PROBE LOG

SITE A DATE IN 8-8-77

PROBE PLACEMENT Convective Section

COAL Stansbury, Kemmerer, Consolidation

DATE	PROBE TEMP.	PROBE VAC. "H_2O	BOILER LOAD	NOTES
9/11/77	610°F	-10" H_2	180,000	New Tem working well
9/22/77	700°F	-10" H_2		Probe removed for coupon change
9/25/77	610°F	-10" H_2		replaced coupons 21+23
				With coupons 27+29,
				28 was scrapped because
				of manufacturing flaws.
				550 ml Dowtherm recovered
9/26/77	600°F	-10" H_2		Site A boiler #1 was
				Taken off line for repairs.
				extension cord removed to
				power SASS meter box.
				Controlled at 600°F while
				Boiler winding down
10/2/77				Boiler started on line
				again
10/27/77	720°F	-10" H_2	97%	from checking frequently
				probe ran without difficulty
				and maintained temperature
				range easily
				Probe Removed permanently
				from Site A

ABMA
#15900

SECTION 5.0

FUEL AND ASH ANALYSIS

		Page
5.1	List of Coal and Ash Samples Analyzed	194
5.2	Commercial Testing Analysis	195
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5.4	Coal Sieve Analysis	247

LIST OF COAL AND ASH SAMPLES ANALYZED
ABMA - TEST SITE A

Test No.	Coal & Test*	Coal Sample+	Bottom Ash Sample	Multiclone Ash Sample
1	S - SOx	Prox, Ult, Sulfur Forms	--	--
3	S - Part	--	--	--
4	S - Part, Brink	--	--	--
5	S - Part	Prox	--	--
6	S - Part	--	--	--
8	S - SOx	Prox	% Sulfur	--
9	S - SOx	Prox	% Sulfur	--
10	S - Part	Prox, Ult, Min, Fus	--	--
12	S - SOx	Prox	--	--
14	S - Part, Brink	Prox	% Combustibles	--
15	S - Part	Prox	--	--
16	S - Part	Prox	% Combustibles	--
17	SK - Part	Prox	% Combustibles	--
18	SK - SOx	Prox	% Sulfur	--
19	S - Brink	Prox	--	--
20	K - SOx, Brink	--	--	--
21	K - Part	Prox	--	% Combustibles
22	K - Part	Prox	--	--
23	K - Part	Prox, Ult, Min	% Combustibles	--
24	K - Part	Prox, Fus	% Combustibles	% Combustibles
26A	K - Part	Prox	% Combustibles	% Combustibles
26B	K - Part	Prox	% Combustibles	% Combustibles
27	K - SASS	Prox, Ult, Min	X	X
28	K - Part	Prox	--	% Combustibles
29	K - Part	Prox, Ult, Fus	% Combustibles	% Combustibles
30	K - Brink	Prox	--	--
34	C - SASS, Part, SOx	Prox	% Comb, % Sulfur	% Comb, % Sulfur
35	C - SASS, Part, SOx	Prox, Ult, Min, Fus	% Comb, % Sulfur	% Comb, % Sulfur
36	C - Part	Prox	--	% Combustibles
37	C - Part	Prox	--	--
38	C - Part	Prox	% Combustibles	% Combustibles
39	C - Part	Prox	% Combustibles	% Combustibles
40	K - SASS	Prox, Ult, Min	X	X

* S - Stansbury Coal Co.
K - Kemmerer Coal Co.
SK - Blend of Stansbury & Kemmerer
C - Consolidation Coal Co.
Part - Particulate Loading
SOx - Sulfur Oxides
Brink - Brink Cascade Impactor
SASS - Source Assessment Sampling System

Prox - Proximate Analysis
Ult - Ultimate Analysis
Min - Mineral Analysis
Fus - Ash Fusion Temperatures
X - Sample Held for Future Analysis
-- - No Sample Obtained

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16120 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 364-1173

SINCE 1908

Aug. 30, 1977

KVB, INC.
600 S. County Road 18
Minneapolis, MN 54426

	Sample identification by	KVB, Inc.
Kind of sample reported to us	-----	Coal Sample TEST SITE A 8/8/77
Sample taken at	-----	Taken from Conveyor belt, not associated with test
Sample taken by	KVB, Inc.	
Date sampled	-----	

Analysis report no. 71-5193

PROXIMATE ANALYSIS

	As Rec'd	Dry
% Moisture	14.21	xxxxx
% Ash	7.00	8.16
% Volatile	33.96	39.58
% Fixed Carbon	44.83	52.26
	100.00	100.00
Btu	10365	12082
% Sulfur	1.05	1.22

ULTIMATE ANALYSIS

	As Rec'd	Dry
% Moisture	14.21	xxxxx
% Carbon	60.64	70.68
% Hydrogen	4.24	4.94
% Nitrogen	1.01	1.18
% Chlorine	0.00	0.00
% Sulfur	1.05	1.22
% Ash	7.00	8.16
% Oxygen(diff)	11.85	13.82
	100.00	100.00

SULFUR FORMS

	As Rec'd	Dry
%Pyritic Sulfur	0.38	0.44
%Sulfate Sulfur	0.03	0.04
%Organic Sul. (dif)	0.64	0.74
Total Sulfur	1.05	1.22

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

Oct. 14, 1977

KVB, INC.
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by

KVB, Inc.

Site A Test 5

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled -----

Analysis report no. 71-7342

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	15.33	xxxxx
% Ash	5.21	6.14
% Volatile	34.29	40.45
% Fixed Carbon	45.27	53.41
	100.00	100.00
Btu	10588	12489
% Sulfur	1.02	1.20

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
18130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54226

Att: Peter L. Langsjoen

Sample identification by: KVB Inc.

Coal Test 8

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB Inc.

Date sampled: -----

Analysis report no. 71-11218

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	13.10	xxxxx
% Ash	5.79	6.66
% Volatile	35.18	40.48
% Fixed Carbon	45.93	52.86
	100.00	100.00
Btu	10838	12471
% Sulfur	0.97	1.12

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager Midwest Division

RAH:lf

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426
Att: Peter L. Langsjoen

Sample identification by: KVB Inc.

Bottom Ash Test 8

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB Inc.

Date sampled: -----

Analysis report no. 71-11215

%Sulfur, Dry -------- 0.05

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Metallurgist

RAH:lf

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 338 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO
18130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by: KVB Inc.

Coal Test 9

Kind of sample reported to us	-----
Sample taken at	-----
Sample taken by	KVB Inc.
Date sampled	-----

Analysis report no. 71-11219

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	14.57	xxxxx
% Ash	5.95	6.96
% Volatile	34.79	40.72
% Fixed Carbon	44.69	52.32
	100.00	100.00
Btu	10637	12451
% Sulfur	0.91	1.06

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Industrial Division

RAH:lf

Charter Member

CHICAGO, ILLINOIS • CHARLESTON, W VA. • CLARKSBURG, W VA. • CLEVELAND, OHIO • NORFOLK, VA. • HENDERSON, KY. • TOLEDO, OHIO • DENVER, COLORADO • BIRMINGHAM, ALABAMA • VANCOUVER, B.C.

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by KVB Inc.

Kind of sample reported to us -----

Bottom Ash Test 9

Sample taken at -----

Sample taken by KVB Inc.

Date sampled -----

Analysis report no. 71-11216

%Sulfur, Dry ---------- 0.06

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

200

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 28, 1978

KVB, INC.
Shelard tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB, Inc.

Date sampled: -----

Sample identification by

KVB, Inc.

P. O. No. 323-15900

Coal Site A Test #10

Analysis report no. 71-13868

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	13.70	xxxxx
% Ash	6.70	7.76
% Volatile	34.33	39.78
% Fixed Carbon	45.27	52.46
	100.00	100.00
Btu	10505	12173
% Sulfur	0.92	1.07
% Alk. as Na_2O	xxxxx	0.08

SULFUR FORMS		
% Pyritic Sulfur	xxxxx	xxxxx
% Sulfate Sulfur	xxxxx	xxxxx
% Organic Sulfur	xxxxx	xxxxx

WATER SOLUBLE ALKALIES	
% Na_2O =	xxxxx
% K_2O =	xxxxx

FUSION TEMPERATURE OF ASH	Reducing	Oxidizing
Initial Deformation	2000°F	2120 °F
H is Cone Height — Softening (H = W)	2190°F	2410 °F
W is Cone Width — Softening (H = ½W)	2240°F	2470 °F
Fluid	2640°F	2700+°F

% EQUILIBRIUM MOISTURE =	xxxxx
HARDGROVE GRINDABILITY INDEX =	xxxxx
FREE SWELLING INDEX =	xxxxx

ULTIMATE ANALYSIS	% Weight As received	% Weight Dry basis
Moisture	13.70	xxxxx
Carbon	60.30	69.87
Hydrogen	4.08	4.73
Nitrogen	0.96	1.11
Chlorine	0.02	0.02
Sulfur	0.92	1.07
Ash	6.70	7.76
Oxygen (diff)	13.32	15.44
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basis
Silica; SiO_2	59.32
Alumina, Al_2O_3	12.90
Titania, TiO_2	0.55
Ferric oxide, Fe_2O_3	11.10
Lime, CaO	5.92
Magnesia, MgO	2.16
Potassium oxide, K_2O	1.06
Sodium oxide, Na_2O	0.32
Sulfur trioxide, SO_3	5.71
Phos. pentoxide, P_2O_5	0.19
Undetermined	0.77
	100.00

SILICA VALUE =	75.57
BASE: ACID RATIO	0.28
T_{250} Temperature =	2590°F

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager Midwest Division

RAH:lau

201

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 230 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO
18130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by
KVB, Inc.

Coal Stie A
Test #12

P. O. No. 323-15900

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled -----

Analysis report no. 71-13869

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	13.36	xxxxx
% Ash	5.70	6.58
% Volatile	35.15	40.57
% Fixed Carbon	45.79	52.85
	100.00	100.00
Btu	10548	12174
% Sulfur	0.88	1.01

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lau

202

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 236 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16138 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

Oct. 14, 1977

KVB, INC.
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

Site A Test 14

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. 71-7343

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	14.61	xxxxx
% Ash	4.49	5.26
% Volatile	35.03	41.02
% Fixed Carbon	45.87	53.72
	100.00	100.00
Btu	10780	12624
% Sulfur	0.90	1.05

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

203

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601-• AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

P. O. No. 323-15900

See Below for Identification

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. See Below

LAB NUMBER	IDENTIFICATION	%ASH (DRY)
71-13882	Bottom Ash Site A Test #14	99.26

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Chemical Section

RAH:lau

204

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8484

PLEASE ADDRESS ALL CORRESPONDENCE TO
18130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by
KVB, Inc.

Coal Site A
Test #15

P. O. No. 323-15900

Kind of sample reported to us	-----
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	-----

Analysis report no. 71-13870

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	13.56	xxxxx
% Ash	6.13	7.09
% Volatile	35.69	41.29
% Fixed Carbon	44.62	51.62
	100.00	100.00
Btu	10567	12225
% Sulfur	0.86	1.00

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lau

205

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO
18130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

Oct. 14, 1977

KVB, INC.
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by
KVB, Inc.

Site A Test 16

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled -----

Analysis report no. 71-7344

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	17.85	xxxxx
% Ash	6.79	8.26
% Volatile	33.20	40.42
% Fixed Carbon	42.16	51.32
	100.00	100.00
Btu	9969	12136
% Sulfur	0.62	0.76

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

206

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 ~ AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

P. O. No. 323-15900

Kind of sample reported to us: -----

Sample taken at: -----

See Below for Identification

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. See Below

LAB NUMBER	IDENTIFICATION	%ASH (DRY)
71-13883	Bottom Ash Site A Test #16	99.88

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Midwest Division

RAH:lau

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8454

PLEASE ADDRESS ALL CORRESPONDENCE TO
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by
KVB, Inc.

Coal Site A
Test #17

P. O. No. 323-15900

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled -----

Analysis report no. 71-13871

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	17.80	xxxxx
% Ash	3.94	4.79
% Volatile	35.72	43.45
% Fixed Carbon	42.54	51.76
	100.00	100.00
Btu	10350	12591
% Sulfur	0.63	0.77

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lau

208

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 ~ AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

P. O. No. 323-15900

See Below for Identification

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. See Below

LAB NUMBER	IDENTIFICATION	%ASH (DRY)
71-13884	Bottom Ash Site A Test #17	99.72

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Midwest Division

RAH:lau

209

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 336 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-6434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by: KVB, Inc.

Coal Test 18

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB Inc.

Date sampled: -----

Analysis report no. 71-11220

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	15.05	xxxxx
% Ash	5.90	6.94
% Volatile	34.72	40.87
% Fixed Carbon	44.33	52.19
	100.00	100.00
Btu	10538	12405
% Sulfur	0.88	1.04

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

210

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 364-1173

SINCE 1908

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by: KVB Inc.

Bottom Ash Test 18

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB Inc.

Date sampled: -----

Analysis report no. 71-11217

%Sulfur, Dry ---------- 0.16

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

211

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

Oct. 14, 1977

KVB, INC.
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

Site A Test 19

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. 71-7345

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	15.64	xxxxx
% Ash	8.04	9.53
% Volatile	33.97	40.27
% Fixed Carbon	42.35	50.20
	100.00	100.00
Btu	10107	11980
% Sulfur	0.92	1.09

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

212

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 936 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8484

PLEASE ADDRESS ALL CORRESPONDENCE TO
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by
KVB, Inc.

Coal Site A
Test #21

P. O. No. 323-15900

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled -----

Analysis report no. 71-13872

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	17.83	xxxxx
% Ash	2.65	3.23
% Volatile	35.99	43.80
% Fixed Carbon	43.53	52.97
	100.00	100.00
Btu	10514	12795
% Sulfur	0.49	0.60

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lau

213

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

P. O. No. 323-15900

See Below for Identification

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. See Below

LAB NUMBER	IDENTIFICATION	%ASH (DRY)
71-13889	Multictone Ash Site A Test #21	23.30

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Midwest Division

RAH:lau

Charter Member

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COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 230 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-2424

PLEASE ADDRESS ALL CORRESPONDENCE TO
6130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by
KVB, Inc.

Coal Site A
Test #22

P. O. No. 323-15900

Kind of sample reported to us	-----
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	-----

Analysis report no. 71-13873

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	18.94	xxxxx
% Ash	2.63	3.25
% Volatile	34.45	42.50
% Fixed Carbon	43.98	54.25
	100.00	100.00
Btu	10338	12754
% Sulfur	0.54	0.67

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lau

Charter Member

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COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Nov. 8, 1977

KVB, INC.
600 S. County Road 18
Minneapolis, MN 54426

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled -----

Sample identification by

KVB, Inc.

Site A Test 23

Analysis report no. 71-7346

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	20.43	xxxxx
% Ash	2.86	3.59
% Volatile	34.61	43.50
% Fixed Carbon	42.10	52.91
	100.00	100.00
Btu	10242	12871
% Sulfur	0.56	0.70
% Alk. as Na_2O	xxxxx	0.02

SULFUR FORMS		
% Pyritic Sulfur	xxxxx	xxxxx
% Sulfate Sulfur	xxxxx	xxxxx
% Organic Sulfur	xxxxx	xxxxx

WATER SOLUBLE ALKALIES		
% Na_2O =	xxxxx	xxxxx
% K_2O =	xxxxx	xxxxx

FUSION TEMPERATURE OF ASH	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
H is Cone Height — Softening (H = W)	xxxxx	xxxxx
W is Cone Width — Softening (H = ½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

% EQUILIBRIUM MOISTURE = xxxxx
HARDGROVE GRINDABILITY INDEX = xxxxx
FREE SWELLING INDEX = xxxxx

ULTIMATE ANALYSIS	% Weight As received	% Weight Dry basis
Moisture	20.43	xxxxx
Carbon	58.97	74.11
Hydrogen	4.02	5.05
Nitrogen	0.72	0.91
Chlorine	0.00	0.00
Sulfur	0.56	0.70
Ash	2.86	3.59
Oxygen (diff)	12.44	15.64
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basis
Silica; SiO_2	44.81
Alumina, Al_2O_3	18.14
Titania, TiO_2	0.62
Ferric oxide, Fe_2O_3	4.04
Lime, CaO	11.65
Magnesia, MgO	3.92
Potassium oxide, K_2O	0.55
Sodium oxide, Na_2O	0.30
Sulfur trioxide, SO_3	14.93
Phos. pentoxide, P_2O_5	0.12
Undetermined	0.92
	100.00

SILICA VALUE = 69.56
BASE: ACID RATIO 0.32
T_{250} Temperature = 2515°F

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager Midwest Division

RAH:lf

216

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
15130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by: KVB Inc.

Bottom Ash Test 23

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB Inc.

Date sampled: -----

Analysis report no. 71-11210

%Ash, Dry ---------- 99.74

%Combustible, Dry ----- 0.26

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

217

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
18130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

Dec. 1, 1977

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, Minn. 54426

Sample identification by: KVB, Inc.

Kind of sample reported to us: ----- Texas Gulf Coal Sample

Sample taken at: ----- Test 24

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. 71-10030

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	19.56	xxxxx
% Ash	2.92	3.63
% Volatile	34.67	43.10
% Fixed Carbon	42.85	53.27
	100.00	100.00
Btu	10323	12832
% Sulfur	0.58	0.72

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	2260°F	2330°F
Softening (H=W)	2360°F	2400°F
Softening (H=½W)	2460°F	2485°F
Fluid	2565°F	2580°F

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager Midwest Division

RAH:lf

Charter Member

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COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 230 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
18130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Jan. 11, 1978

KVB INC,
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by: KVB Inc.

Bottom Ash Test 24

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB Inc.

Date sampled: -----

Analysis report no. 71-11211

%Ash, Dry ---------- 99.47

%Combustible, Dry ----- 0.53

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

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Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 936 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by: KVB Inc.

Multiclone Ash Test 24

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB Inc.

Date sampled: -----

Analysis report no. 71-11223

SCREEN ANALYSIS Size	%Wt.		%ASH (DRY)	%COMBUSTIBLE (DRY)
+20M	4.3		27.44	72.56
20M X 100M	34.4		38.68	61.32
100M X 0	61.3		95.00	5.00
	100.0	Wtd. Average	72.72	27.28

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

Charter Member

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COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO
6130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by
KVB, Inc.

Coal Site A
Test #26A

P. O. No. 323-15900

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled -----

Analysis report no. 71-13874

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	18.09	xxxxx
% Ash	3.27	3.99
% Volatile	35.31	43.11
% Fixed Carbon	43.33	52.90
	100.00	100.00
Btu	10487	12803
% Sulfur	0.75	0.91

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager Midwest Division

RAH:lau

221

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

P. O. No. 323-15900

See Below for Identification

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. See Below

LAB NUMBER	IDENTIFICATION	%ASH (DRY)
71-13885	Bottom Ash Site A Test #26A	98.13

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Midwest Division

RAH:lau

222

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 55426

April 28, 1978

Sample identification by P. J. Langsjoen

Kind of sample reported to us: Multiclone ash samples Site A

Sample taken at: xxxxx

P. O. No. 323-15900

Sample taken by: KVB, Inc.

Date sampled: 4/11/78

Analysis report no. See below

Analysis report No.	Identification	% Ash, Dry Basis
71-13890	Test #26A	41.19
71-13891	Test #26B	25.83
71-13892	Test #28	19.41
71-13893	Test #29	41.27
71-13894	Test #36	31.55
71-13895	Test #38	45.29
71-13896	Test #39	51.94

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Midwest Division

RAH/dh

223

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8484

PLEASE ADDRESS ALL CORRESPONDENCE TO
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

Kind of sample reported to us: -----
Coal Site A
Test #26B

Sample taken at: -----

P. O. No. 323-15900

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. 71-13875

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	20.42	xxxxx
% Ash	3.14	3.95
% Volatile	33.92	42.62
% Fixed Carbon	42.52	53.43
	100.00	100.00
Btu	10158	12765
% Sulfur	0.77	0.97

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

E. A. ELOUSER, Manager, Midwest Division

RAH:lau

224

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

P. O. No. 323-15900

See Below for Identification

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. See Below

LAB NUMBER	IDENTIFICATION	%ASH(DRY)
71-13886	Bottom Ash Site A Test #26B	99.83

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Midwest Division

RAH:lau

225

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

June 2, 1978

KVB, INC.
Shelard Tower, Ste. 1357
600 S. County Road 18
Minneapolis, MN 55426

Sample identification by

KVB, Inc.

P. O. No. 323-15900

Coal Sample
Boiler A
Test 27

Kind of sample reported to us	Coal
Sample taken at	xxxxx
Sample taken by	KVB, Inc.
Date sampled	xxxxx

Analysis report no. 71-15019

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
%Moisture	17.17	xxxxx
%Ash	3.54	4.27
%Volatile	35.04	42.30
%Fixed Carbon	44.25	53.43
	100.00	100.00
Btu	10393	12547
%Sulfur	0.85	1.03

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
%Moisture	17.17	xxxxx
%Carbon	60.44	72.97
%Hydrogen	4.12	4.98
%Nitrogen	1.01	1.22
%Chlorine	0.01	0.01
%Sulfur	0.85	1.03
%Ash	3.54	4.27
%Oxygen (diff)	12.86	15.52
	100.00	100.00

MINERAL ANALYSIS

	%Weight, Ign.
Silica, SiO_2	41.66
Alumina, Al_2O_3	18.29
Titania, TiO_2	0.66
Ferric Oxide, Fe_2O_3	4.49
Lime, CaO	12.25
Magnesia, MgO	4.20
Potassium Oxide, K_2O	0.50
Sodium Oxide, Na_2O	0.32
Sulfur Trioxide, SO_3	17.15
Phos. Pent. P_2O_5	0.15
Undetermined	0.33
	100.00

Alk. as Na_2O, Dry Coal = 0.03
SILICA VALUE = 66.55
Base/Acid = 0.36
T_{250} Poises: 2460°F

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Midwest Division

RAH:lau

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by KVB, Inc.

Coal Site A
Test #28

P. O. No. 323-15900

Kind of sample reported to us	-----
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	-----

Analysis report no. 71-13876

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	18.29	xxxxx
% Ash	3.02	3.69
% Volatile	34.78	42.57
% Fixed Carbon	43.91	53.74
	100.00	100.00
Btu	10475	12819
% Sulfur	0.65	0.80

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lau

227

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

Dec. 1, 1977

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, Minn. 54426

Sample identification by: KVB, Inc.

Kind of sample reported to us: ----- Coal Sample

Test Side A

Sample taken at: ----- Test 29

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. 71-10031

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	19.79	xxxxx
% Ash	2.80	3.49
% Volatile	34.75	43.32
% Fixed Carbon	42.66	53.19
	100.00	100.00
Btu	10372	12930
% Sulfur	0.59	0.73

ULTIMATE ANALYSIS

	As Rec'd	Dry
%Moisture	19.79	xxxxx
%Carbon	60.30	75.18
%Hydrogen	4.09	5.10
%Nitrogen	0.83	1.03
%Chlorine	0.02	0.02
%Sulfur	0.59	0.73
%Ash	2.80	3.49
%Oxygen(dif)	11.58	14.45
	100.00	100.00

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	2180°F	2285°F
Softening (H=W)	2240°F	2385°F
Softening (H=½W)	2325°F	2485°F
Fluid	2410°F	2600°F

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager Midwest Division

RAH:lf

228

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-2424

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by KVB Inc.

Bottom Ash Test 29

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB Inc.

Date sampled -----

Analysis report no. 71-11212

%Ash, Dry ---------- 100.06

%Combustible, Dry ----- *

*Ash = over 100%

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

229

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 238 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by

KVB, Inc.

Coal Site A
Test #30

P. O. No. 323-15900

Kind of sample reported to us	-----
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	-----

Analysis report no. 71-13877

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	20.34	xxxxx
% Ash	2.81	3.53
% Volatile	34.63	43.47
% Fixed Carbon	42.22	53.00
	100.00	100.00
Btu	10202	12807
% Sulfur	0.53	0.67

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lau

230

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

Dec. 1, 1977

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, Minn. 54426

Sample identification by: KVB, Inc.

Kind of sample reported to us: ----- Boiler A

Coal Sample

Sample taken at: ----- Test 34

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. 71-10032

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	12.72	xxxxx
% Ash	8.79	10.07
% Volatile	33.82	38.75
% Fixed Carbon	44.67	51.18
	100.00	100.00
Btu	10534	12069
% Sulfur	0.73	0.42

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager Midwest Division

RAH:lf

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by
KVB Inc.

Bottom Ash Test 34

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB Inc.

Date sampled -----

Analysis report no. 71-11213

%Ash, Dry ----------	99.18
%Combustible, Dry ---	0.82
%Sulfur, Dry --------	0.01

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH;f

232

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 284-1173

SINCE 1908

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by: KVB Inc.

Multiclone Ash Test 34

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB Inc.

Date sampled: -----

Analysis report no. 71-11221

%Ash, Dry ---------- 33.36

%Combustible, Dry--- 66.64

%Sulfur, Dry-------- 0.37

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

233

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Dec. 9, 1977

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, Minn. 54426

Kind of sample reported to us	-----	Sample identification by	KVB, Inc.
Sample taken at	-----		Boiler A
Sample taken by	KVB, Inc.		Coal Sample
Date sampled	-----		Test 35

Analysis report no. 71-10033

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	13.06	xxxxx
% Ash	7.81	8.98
% Volatile	34.37	39.54
% Fixed Carbon	44.76	51.48
	100.00	100.00
Btu	10683	12288
% Sulfur	0.35	0.40
% Alk. as Na_2O	xxxxx	0.13

SULFUR FORMS		
% Pyritic Sulfur	xxxxx	xxxxx
% Sulfate Sulfur	xxxxx	xxxxx
% Organic Sulfur	xxxxx	xxxxx

WATER SOLUBLE ALKALIES		
% Na_2O =	xxxxx	xxxxx
% K_2O =	xxxxx	xxxxx

FUSION TEMPERATURE OF ASH	Reducing	Oxidizing
Initial Deformation	2170°F	2300°F
H is Cone Height — Softening (H = W)	2265°F	2405°F
W is Cone Width — Softening (H = ½W)	2355°F	2510°F
Fluid	2420°F	2610°F

% EQUILIBRIUM MOISTURE = xxxxx
HARDGROVE GRINDABILITY INDEX = xxxxx
FREE SWELLING INDEX = xxxxx

ULTIMATE ANALYSIS	% Weight As received	% Weight Dry basis
Moisture	13.06	xxxxx
Carbon	62.19	71.54
Hydrogen	4.11	4.73
Nitrogen	0.82	0.94
Chlorine	0.01	0.01
Sulfur	0.35	0.40
Ash	7.81	8.98
Oxygen (diff)	11.65	13.40
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basis
Silica; SiO_2	46.02
Alumina, Al_2O_3	18.65
Titania, TiO_2	0.70
Ferric oxide, Fe_2O_3	6.96
Lime, CaO	14.80
Magnesia, MgO	1.62
Potassium oxide, K_2O	0.65
Sodium oxide, Na_2O	1.02
Sulfur trioxide, SO_3	8.23
Phos. pentoxide, P_2O_5	0.78
Undetermined	0.57
	100.00

SILICA VALUE = 66.31
BASE: ACID RATIO 0.38
T_{250} Temperature = 2435°F

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager Midwest Division

RAH:lf

234

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by
KVB Inc.

Bottom Ash Test 35

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB Inc.

Date sampled -----

Analysis report no. 71-11214

%Ash, Dry	98.34
%Combustible, Dry	1.66
%Sulfur, Dry	0.02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

235

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

SINCE 1908

Jan. 11, 1978

KVB INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Att: Peter L. Langsjoen

Sample identification by: KVB Inc.

Multiclone Ash Test 35

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB Inc.

Date sampled: -----

Analysis report no. 71-11222

%Ash, Dry ---------- 29.98

%Combustible, Dry ---- 70.02

%Sulfur, Dry --------- 0.32

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lf

236

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 330 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by

KVB, Inc.

Coal Site A
Test #36

P. O. No. 323-15900

Kind of sample reported to us	-----
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	-----

Analysis report no. 71-13878

PROXIMATE ANALYSIS

	As received	Dry basis
	12.72	xxxxx
% Moisture	6.14	7.04
% Ash	34.60	39.64
% Volatile	46.54	53.32
% Fixed Carbon	100.00	100.00
	10920	12511
Btu	0.31	0.36
% Sulfur		

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager Midwest Division

RAH:lau

237

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 238 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-9434

PLEASE ADDRESS ALL CORRESPONDENCE TO
18130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by
KVB, Inc.

Coal Site A
Test #37

P. O. No. 323-15900

Kind of sample reported to us	-----
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	-----

Analysis report no. 71-13879

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	11.29	xxxxx
% Ash	8.23	9.28
% Volatile	34.34	38.71
% Fixed Carbon	46.14	52.01
	100.00	100.00
Btu	10768	12138
% Sulfur	0.28	0.32

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lau

Charter Member
American Council of Independent Laboratories, Inc.

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COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by

KVB, Inc.

Coal Site A
Test #38

P. O. No. 323-15900

Kind of sample reported to us -----

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled -----

Analysis report no. 71-13880

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	12.87	xxxxx
% Ash	8.71	10.00
% Volatile	33.96	38.98
% Fixed Carbon	44.46	51.02
	100.00	100.00
Btu	10479	12026
% Sulfur	0.32	0.37

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Mineral Division

RAH:lau

239

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

P. O. No. 323-15900

See Below for Identification

Kind of sample reported to us: -----

Sample taken at: -----

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. See Below

LAB NUMBER	IDENTIFICATION	%ASH (DRY)
71-13387	Bottom Ash Site A Test #38	99.77

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Midwest Division

RAH:lau

240

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 338 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8484

LEASE ADDRESS ALL CORRESPONDENCE TO
5130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

Coal Site A
Test #39

P. O. No. 323-15900

Kind of sample reported to us	-----
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	-----

Analysis report no. 71-13881

PROXIMATE ANALYSIS

	As received	Dry basis
% Moisture	14.28	xxxxx
% Ash	7.68	8.96
% Volatile	33.79	39.42
% Fixed Carbon	44.25	51.62
	100.00	100.00
Btu	10386	12116
% Sulfur	0.40	0.47

FUSION TEMPERATURE OF ASH

	Reducing	Oxidizing
Initial Deformation	xxxxx	xxxxx
Softening (H=W)	xxxxx	xxxxx
Softening (H=½W)	xxxxx	xxxxx
Fluid	xxxxx	xxxxx

H is Cone Height
W is Cone Width

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH:lau

241

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

April 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

Sample identification by: KVB, Inc.

P. O. No. 323-15900

Kind of sample reported to us: -----

Sample taken at: -----

See Below for Identification

Sample taken by: KVB, Inc.

Date sampled: -----

Analysis report no. See Below

LAB NUMBER	IDENTIFICATION	%ASH (DRY)
71-13888	Bottom Ash Site A Test #39	97.20

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Midwest Division

RAH:lau

242

Charter Member

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN ROAD, SOUTH HOLLAND, ILLINOIS 60473

OFFICE TEL. (312) 264-1173

May 26, 1978

KVB, INC.
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 54426

		Sample identification by
Kind of sample reported to us	Coal	KVB, Inc.
Sample taken at	xxxxx	Coal Sample Boiler A Test 40
Sample taken by	KVB, Inc.	
Date sampled	xxxxx	

Analysis report no. 71-15020

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
%Moisture	17.83	xxxxx
%Ash	4.58	5.57
%Volatile	34.05	41.44
%Fixed Carbon	43.54	52.99
	100.00	100.00
Btu	10206	12420
%Sulfur	0.63	0.77

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
%Moisture	17.83	xxxxx
%Carbon	58.99	71.79
%Hydrogen	4.08	4.97
%Nitrogen	0.84	1.02
%Chlorine	0.00	0.00
%Sulfur	0.63	0.77
%Ash	4.58	5.57
%Oxygen (diff)	13.05	15.88
	100.00	100.00

MINERAL ANALYSIS

	%Weight, Ign.
Silica, SiO_2	51.88
Alumina, Al_2O_3	18.49
Titania, TiO_2	0.75
Ferric Oxide, Fe_2O_3	5.02
Lime, CaO	8.12
Magnesia, MgO	2.76
Potassium Oxide, K_2O	0.90
Sodium Oxide, Na_2O	0.32
Sulfur Trioxide, SO_3	10.77
Phos. Pent. P_2O_5	0.18
Undetermined	0.81
	100.00

Alk. As Na_2O, Dry Coal: 0.05
SILICA VALUE: 76.54
Base/Acid: 0.24
T_{250} Poises: 2665°F

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser, Manager, Midwest Division

RAH:lau

Charter Member

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COMBUSTIBLES DATA SHEET

SITE ABMA - SITE A

Crucible Number	Sample Origin	Crucible Weight grams	Crucible & Sample Weight Post 110°C gms	Sample Weight grams	Post 750°C grams	Δ Weight grams	% Combustibles
1	multi OUT Test #3 8/11/77	3.6806	4.0302	.3495	3.9382	.0920	26.3
		3.6808	4.0302		3.9382		
		3.6807	4.0303		3.9382		
	AVG.	3.6807	4.0302		3.9382		
2	multi OUT Test #4 8/17/77	3.9724	4.3050	.3326	4.2077	.0972	29.2
		3.9725	4.3050		4.2078		
		3.9724	——		4.2079		
	AVG.	3.9724	4.3050		4.2078		
3	multi OUT Test #5 8/18/77	3.6681	4.0197	.3520	3.8874	.1324	37.6
		3.6681	4.0204		3.8878		
		3.6682	4.0203		3.8878		
	AVG.	3.6681	4.0201		3.8877		
4	Multi OUT Test #6	3.7105	4.1554	.4448	3.9811	.1741	39.1
		3.7106	——		3.9813		
		3.7106	——		3.9814		
	AVG.	3.7106	4.1554		3.9813		
6	multi OUT Test #10 8/24/77	3.7397	3.9648	.2253	3.9197	.0453	20.1
		3.7398	3.9651		3.9197		
		3.7397	3.9650		3.9197		
	AVG.	3.7397	3.9650		3.9197		
7	multi OUT Test #15 8/27/77	3.7833	4.0707	.2874	3.9629	.1080	37.5
		3.7836	4.0709		3.9628		
		3.7833	4.0708		3.9627		
	AVG.	3.7834	4.0708		3.9628		
8	multi out Test #16 8/30/77	3.8303	4.0071	.1769	3.9692	.0379	21.4
		3.8304	4.0074		3.9693		
		3.8302	4.0072		3.9694		
	AVG.	3.8303	4.0072		3.9693		
1	BLR OUT Test #21 9/23/77	18.4210	22.7130	4.2931	19.3774	3.365	77.7
		18.4210	22.7141		19.3779		
		18.4211	22.7152		19.3776		
	AVG.	18.4210	22.7141		19.3776		72.1
2	BLR OUT Test #21	18.1393	23.3955	5.2583	19.8804	3.5168	66.9
		18.1391	23.3978		19.8809		
		18.1392	23.3992		19.8808		
	AVG.	18.1392	23.3975		19.8807		
3	BLR OUT Test #22 9/23/77	18.5968	24.6902	6.0947	20.2473	4.4477	72.9
		18.5964	24.6912		20.2478		
		18.5966	24.6924		20.2475		
	AVG.	18.5966	24.6913		20.2476		53.4
4	BLR OUT Test #22	18.0836	26.7754	8.6951	22.5908	4.1878	48.2
		18.0837	26.7799		22.5901		
		18.0838	26.7805		22.5909		
	AVG.	18.0837	26.7788		22.5909		

COMBUSTIBLES DATA SHEET

SITE ABMA - SITE A

Crucible Number	Sample Origin	Crucible Weight grams	Crucible & Sample Weight Post 110°C gms	Sample Weight grams	Post 750°C grams	Δ Weight grams	% Combustibles
5	Test #27	18.3872	24.1026	5.7163	21.6063	2.4963	43.7
		18.3872	24.1032		21.6069		
		18.3873	24.1045		21.6069		
	AVG.	18.3872	24.1035		21.6067		
6	Test #24	17.6392	22.0718	4.4345	19.3792	2.6941	60.8
		17.6395	22.0752		19.3800		
		17.6396	22.0751		19.3802		
	AVG.	17.6396	22.0741		19.3800		
5	Test #28	18.3875	25.7586	7.3711	21.0780	4.6806	63.5
		18.3875	25.7586		21.0781		65.8
		18.3875	25.7587		21.0780		
	AVG.	18.3875	25.7586		21.0780		
9	Test #28	18.0970	26.5611	8.4642	20.8225	5.7337	67.8
		18.0970	26.5612		20.8225		
		18.0971	26.5614		20.8226		
	AVG.	18.0970	26.5612		20.8225		
2	Test #29	18.5973	22.1154	3.5182	19.9914	2.1240	60.3
		18.5973	22.1155		19.9916		54.6
		18.5974	22.1152		19.9916		
	AVG.	18.5973	22.1155		19.9915		
3	Test #29	18.1396	26.4199	8.2802	22.0977	4.3222	52.2
		18.1397	26.4198		22.0978		
		18.1397	26.4199		22.0975		
	AVG.	18.1397	26.4199		22.0977		
6	Test #21	17.6399	20.7708	3.1309	18.7925	1.9783	63.2
		17.6400	20.7708		18.7926		
		17.6402	20.7710		18.7926		
	AVG.	17.6400	20.7709		18.7926		
7	Test D24	18.5167	26.4028	7.1860	22.9883	3.4146	43.3
		18.5168	26.4027		22.9882		
		18.5169	26.4029		22.9883		
	AVG.	18.5168	26.4028		22.9883		
4	Test #26A	18.0836	24.2442	6.1606	21.0224	3.2219	52.3
		18.0837	24.2442		21.0223		
		18.0837	24.2444		21.0224		
	AVG.	18.0837	24.2443		21.0224		
12	Test #26B	3.9450	4.3684	.4235	4.2379	.1206	30.8
		3.9450	4.3684		4.2379		
		3.9451	4.3687		4.2380		
	AVG.	3.9450	4.3685		4.2379		
	AVG.						

CARBON ANALYSIS

Crucible Number	Sample Origin	Crucible Weight	Crucible + Sample Wt. Post 110°C	Sample Weight	Post 750°C	Residue Weight	% Ash	Post 950°C Weight	Δ Weight	% Volatiles	Fixed Carbon FC= 100-%V-%A
7	Test #36	18.5176	22.3623	3.8447	19.5303			19.4933	.0771	0.9	39.1
		18.5175	22.3622		19.5303			19.4932			
		18.5175	22.3622		19.5304			19.4930			
		18.5175	22.3622		19.5303			19.4932			
6	Test #37	17.6414	23.1902	5.5489	18.6639			18.6237	.0403	0.7	33.8
		17.6414	23.1904		18.6641			18.6236			
		17.6415	23.1904		18.6641			18.6237			
		17.6414	23.1903		18.6640			18.6237			
2	Test #38	18.1417	19.7686	1.6270	19.1389			19.1069	.0320	1.9	36.9
		18.1415	19.7684		19.1391			19.1069			
		18.1414	19.7684		19.1389			19.1070			
		18.1415	19.7685		19.1390			19.1069			
9	Test #39	18.0988	21.6488	3.5501	19.1206			19.0819	.0385	1.0	51.9
		18.0987	21.6487		19.1208			19.0826			
		18.0984	21.6486		19.1208			19.0824			
		18.0986	21.6487		19.1207			19.0823			
5	Test #36	18.3890	23.3909	5.0018	21.3926	3.0039	60.0				
		18.3890	23.3908		21.3927						
		18.3891	23.3909		21.3933						
		18.3890	23.3908		21.3929						
3	Test #37	18.5480	22.7596	4.1616	21.3275	2.7298	65.5				
		18.5481	22.7597		21.3281						
		18.5481	22.7597		21.3281						
		18.5481	22.7597		21.3279						
11	Test #38	18.6156	19.8482	1.2327	19.3700	.7554	61.2				
		18.6154	19.8482		19.3713						
		18.6155	19.8481		19.3714						
		18.6155	19.8482		19.3709						
4	Test #39	18.0848	20.8113	2.7264	19.3698	1.2856	47.1				
		18.0847	20.8111		19.3708						
		18.0848	20.8111		19.3707						
		18.0848	20.8112		19.3704						

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. A

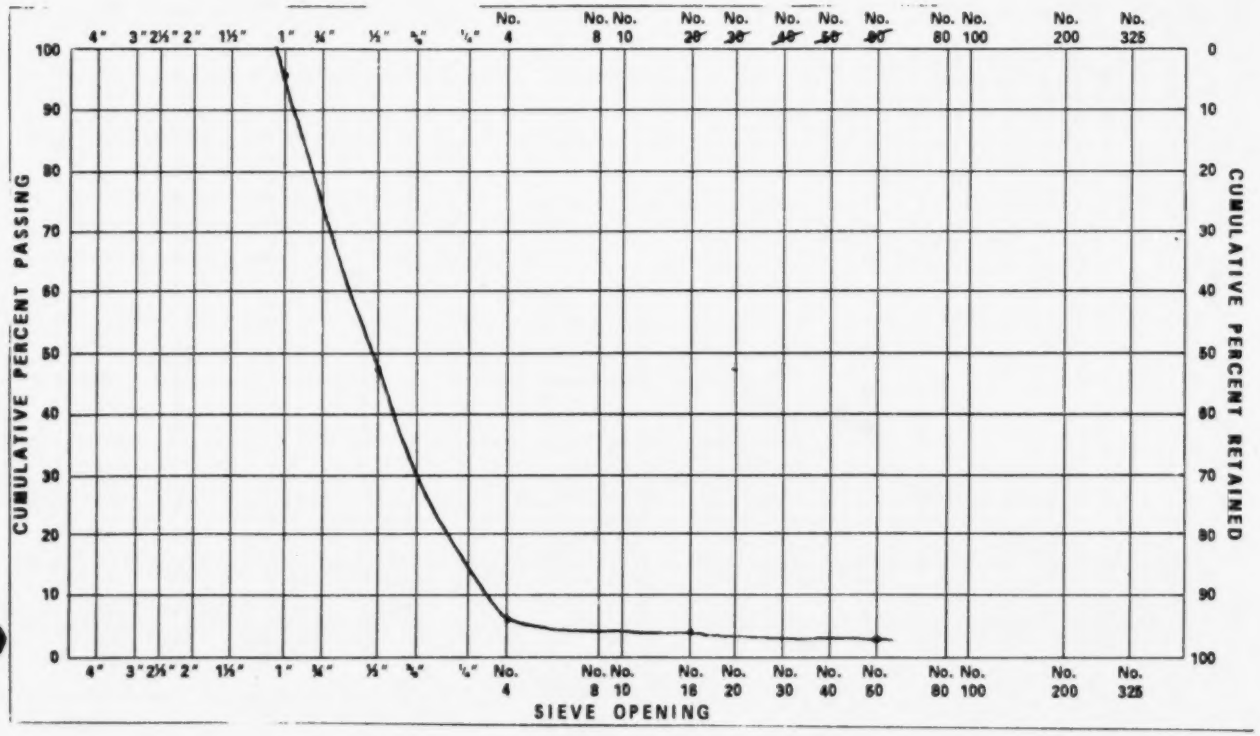
DATE SAMPLE TAKEN Aug 9 1977

TEST SITE ABMA - SITE A

TEST PERFORMED BY PLL

SAMPLE IDENTIFICATION Conveyor Belt grab sample

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	400.4	529.0	158.6	3.60	4563.2	100.00	
1"	400.4	2502.0	2260.2	47.71	4404.6	96.52	
½"	400.4	2297.6	1897.2	43.07	2144.4	46.99	
#4	400.4	452.5	52.1	1.18	247.2	5.42	
#16	400.4	453.4	53.0	1.20	195.1	4.28	
#50	400.4	542.5	142.1	3.23	142.1	3.11	



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. B

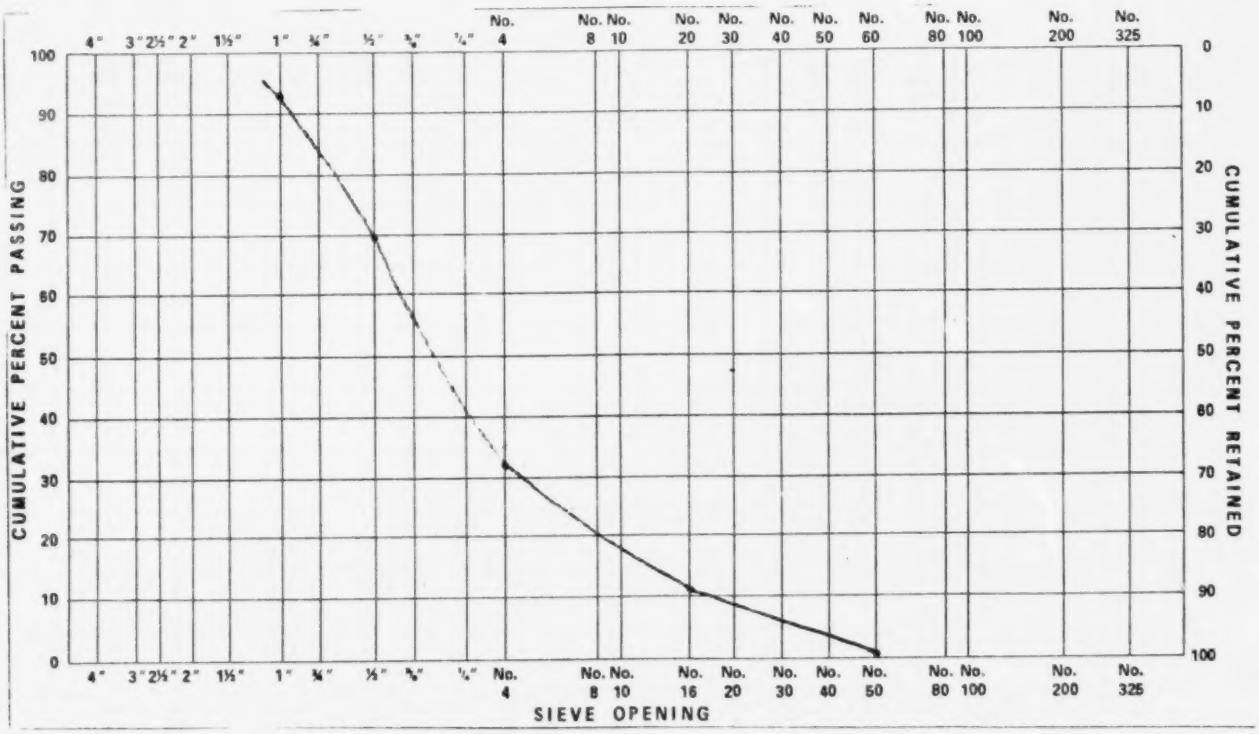
TEST SITE ABMA - SITE A

SAMPLE IDENTIFICATION FEEDER #4

DATE SAMPLE TAKEN Aug 9 1977

TEST PERFORMED BY PLL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	168.7	553.3	384.6	7.15	5376.2	100.00	
1"	168.7	1402.0	1233.3	22.94	4991.6	92.85	
1/2"	168.7	2193.3	2024.6	37.66	3758.3	69.91	
#4	168.7	1321.0	1152.3	21.43	1733.7	32.25	
#16	168.7	729.3	560.6	10.43	581.4	10.82	
#50	168.7	189.5	20.8	0.39	20.8	0.39	



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SIEVE ANALYSIS TEST REPORT

TEST NO. C

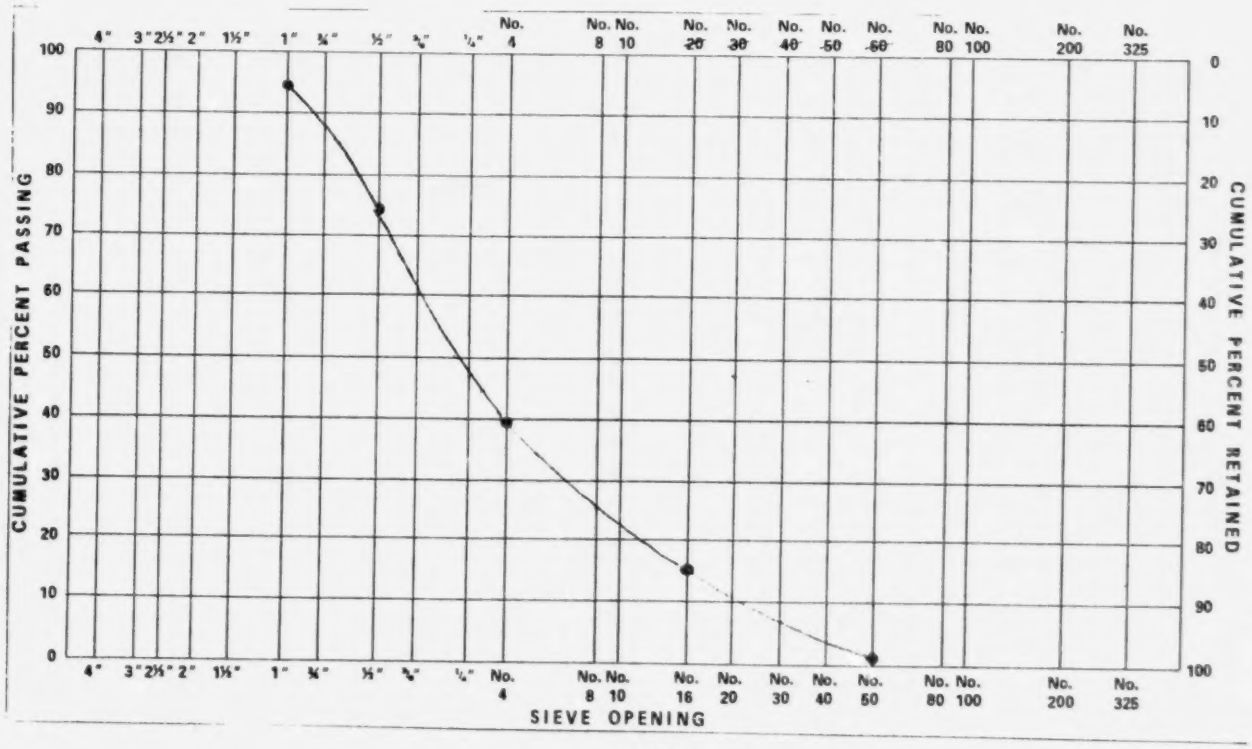
TEST SITE ABMA - SITE A

SAMPLE IDENTIFICATION FROM BELT

DATE SAMPLE TAKEN 8/24/77

TEST PERFORMED BY [illegible]

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOT	168.0	455.7	287.7	5.2	5866.8	100.0	1
1"	168.0	1316.5	1148.5	20.6	5579.1	94.8	2
½"	168.0	2088.4	1920.4	34.5	4130.6	74.2	3
#4	170.0	1538.5	1368.5	24.6	2210.2	39.7	6
#16	170.0	968.7	798.7	14.4	841.7	15.1	15
#50	170.0	297.0	41.0	0.7	41.0	0.7	—



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SIEVE ANALYSIS TEST REPORT

TEST NO. D

TEST SITE ARMA-SITE A

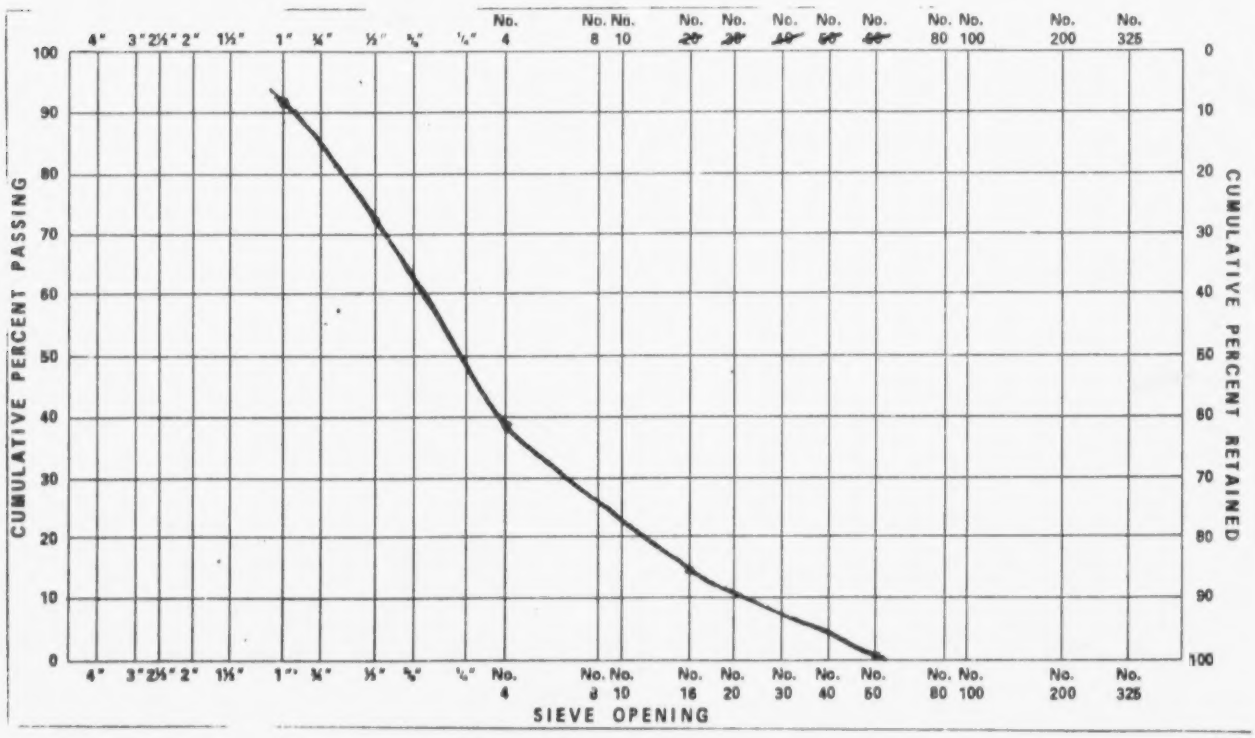
SAMPLE IDENTIFICATION From conveyor belt

DATE SAMPLE TAKEN 11 Sep 77

TEST PERFORMED BY [illegible]

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	168.1	760.3	592.2	7.86	7529.6	100.00	1
1"	168.1	1658.9	14908	19.80	6937.4	92.14	2
½"	168.6	1663.5 + 1203.6	2529.9	33.60	5446.6	72.34	5
#4	168.5	2055.0	1886.5	25.05	2916.7	38.74	10
#16	168.5	1147.2	978.7	13.00	1030.2	13.69	20
#50	168.5	* 220.0	51.5	0.68	51.5	0.69	—

* again, coal not & would not pass thru #50 sieve



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SIEVE ANALYSIS TEST REPORT

TEST NO. —

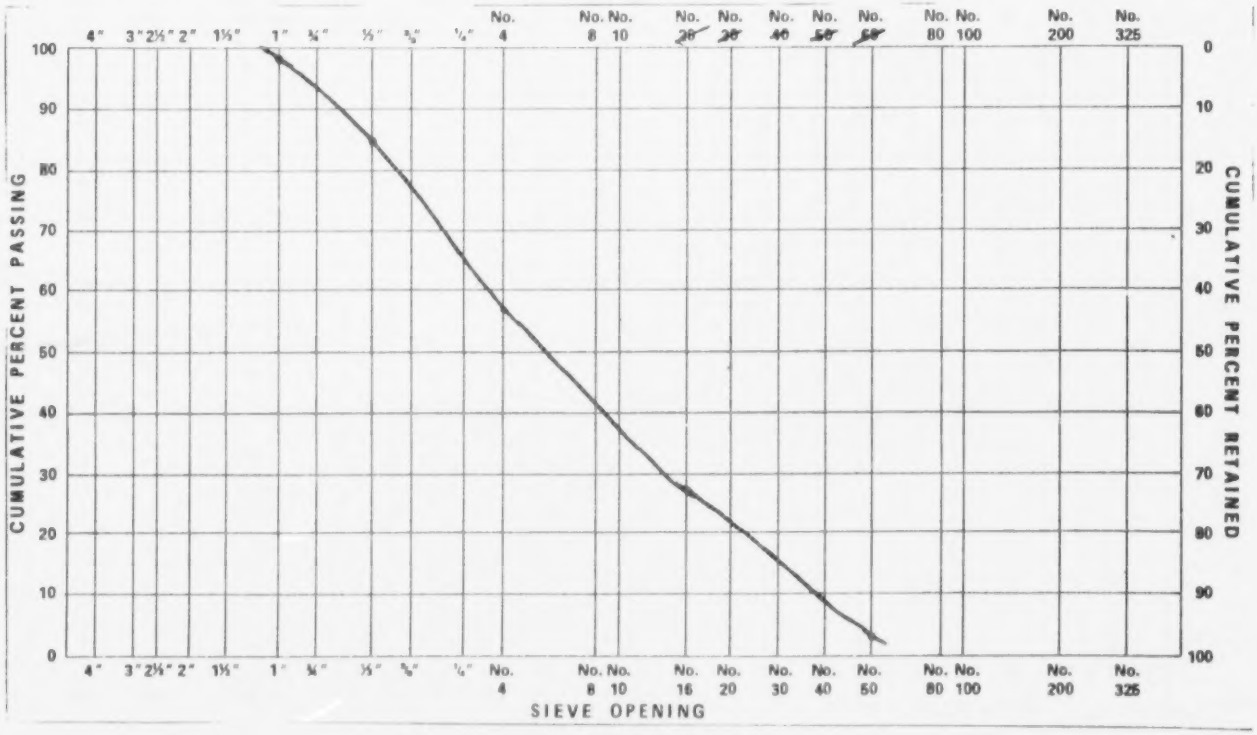
DATE SAMPLE TAKEN 9-15-77

TEST SITE ABMA-SITE A

TEST PERFORMED BY PLL, K

SAMPLE IDENTIFICATION Conveyor Belt

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	168.7	222.0 334.4	219.0	2.40	9109.1	100.00	1
1"	168.7	786.9 717.8	1167.3	12.81	8890.1	97.60	2
$\frac{1}{2}$"	168.7	1675.7 1225.4	2563.7	28.14	7722.8	84.79	5
#4	168.7	1794.4 1249.7	2706.7	29.71	5159.1	56.65	10
#16	168.7	1513.6 1052.7	2228.9	24.47	2452.4	26.94	—
#50	168.7	284.7 276.2	223.5	2.45	223.5	2.47	—



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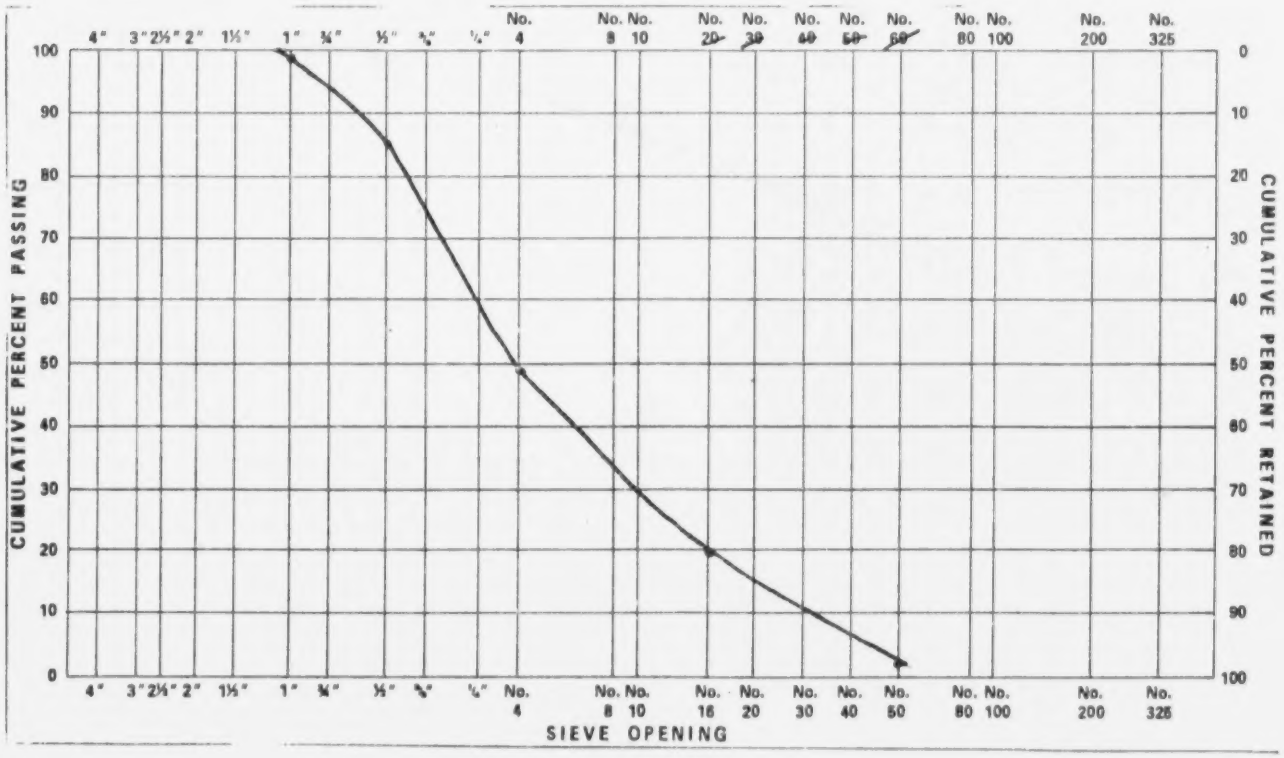
SIEVE ANALYSIS TEST REPORT

TEST NO. _____ DATE SAMPLE TAKEN 9-15-77

TEST SITE ABMA - SITE A TEST PERFORMED BY PLL, JK

SAMPLE IDENTIFICATION FEEDERS

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	168.9	191.3 359.7	113.2	1.49	7595.0	100.00	1
1"	168.9	528.5 839.0	1029.7	13.56	7481.8	98.51	2
½"	168.9	1441.9 1620.0	2724.1	35.87	6452.1	84.95	5
#4	168.9	1324.8 1239.0	2225.2	29.30	3728.0	49.08	10
#16	168.9	819.6 859.2	1341.0	17.66	1502.8	19.78	—
#50	168.9	330.7	161.8	2.13	161.8	2.12	—



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SIEVE ANALYSIS TEST REPORT

TEST NO. 21

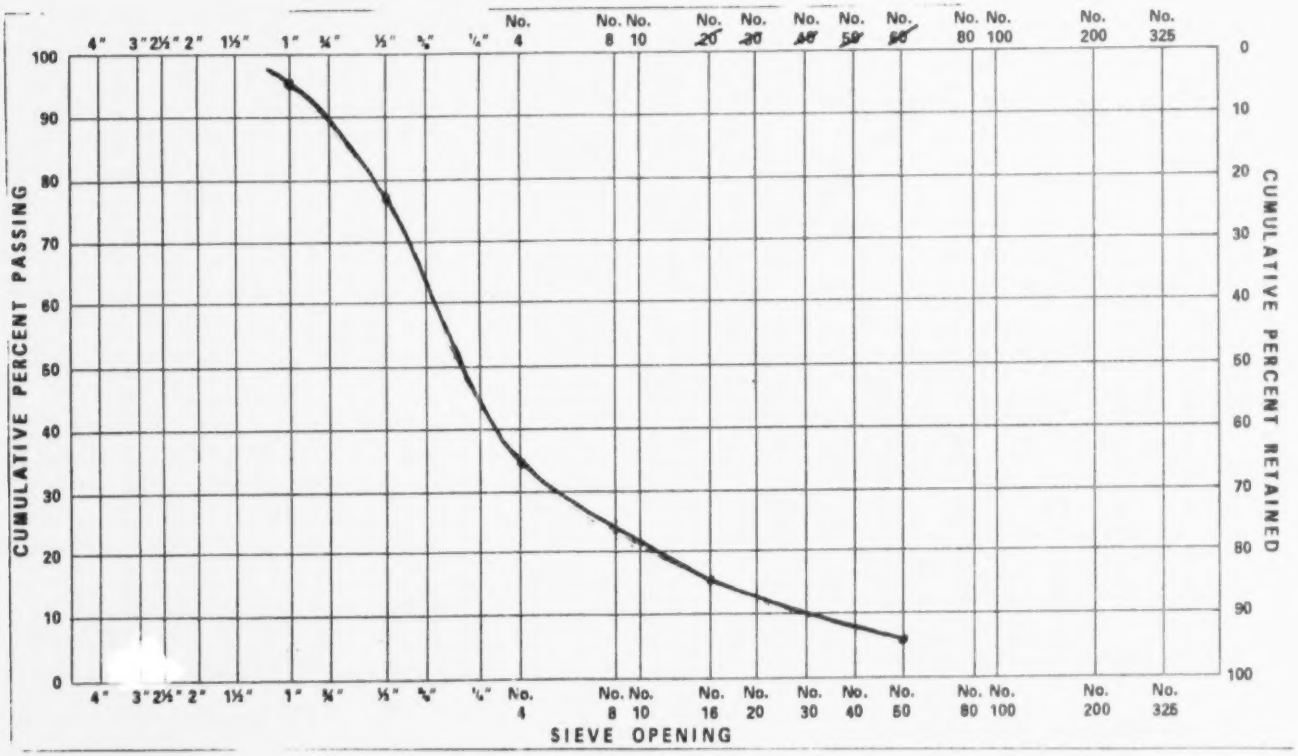
TEST SITE ABMA - SITE A

SAMPLE IDENTIFICATION KEMMERER COAL

DATE SAMPLE TAKEN 9-23-77

TEST PERFORMED BY PLL, JGB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	169.8	339.6 224.0	224.0	4.12	5438.4	100.00	1
1"	169.8	879.8 453.7	993.9	18.28	52144	95.88	2
½"	169.8	1397.8 1331.8	2390.0	43.95	4220.5	77.60	5
#4	169.8	1054.2 280.3	994.9	18.29	18305	33.65	10
#16	169.8	475.6 349.2	485.2	8.92	8356	15.36	15
#50	169.8	520.2	350.4	6.44	350.4	6.44	—



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SIEVE ANALYSIS TEST REPORT

TEST NO. 22

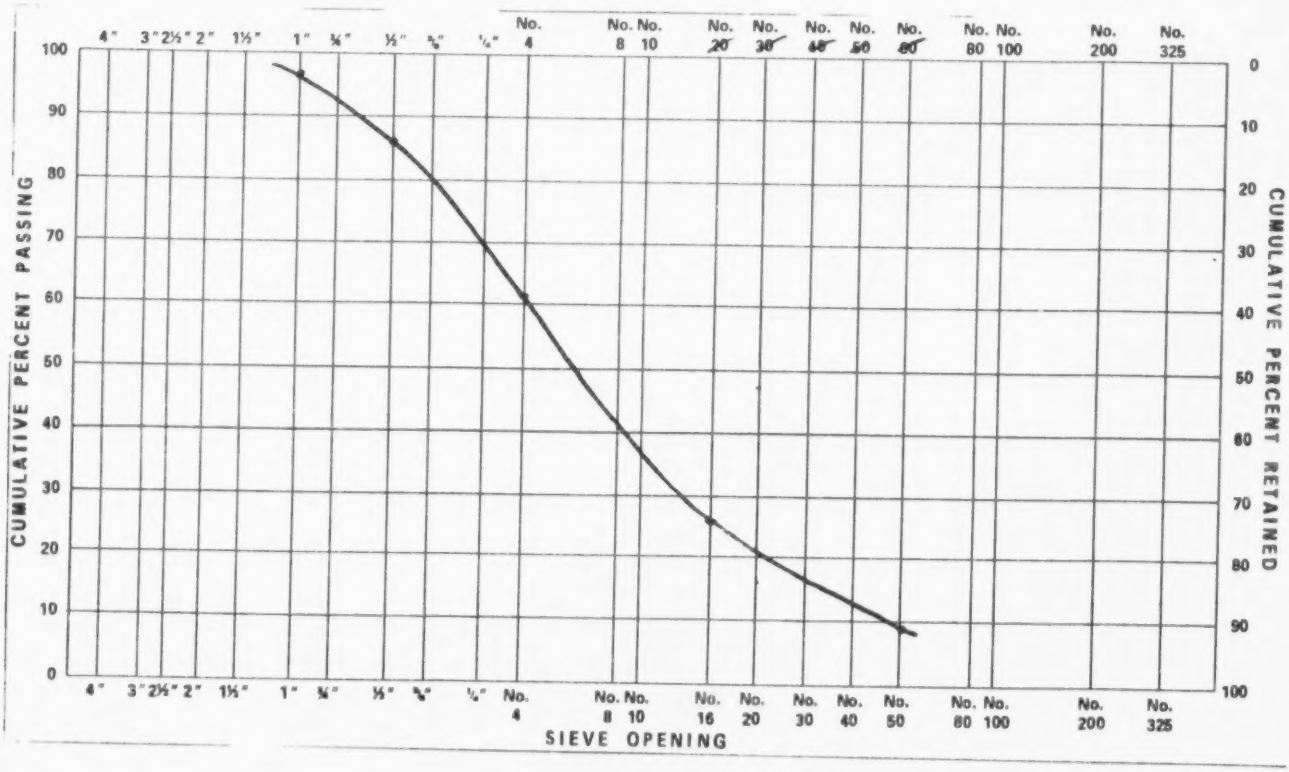
TEST SITE ABMA - SITE A

SAMPLE IDENTIFICATION KEMMERER COAL

DATE SAMPLE TAKEN 9-23-77

TEST PERFORMED BY PLL, JDB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	169.8	269.9	100.1	2.76	3631.7	100.00	1
1"	169.8	552.5	382.7	10.54	3531.6	97.24	2
½"	169.8	1096.5	926.7	25.52	3148.9	86.70	5
#4	169.8	1438.8	1269.0	34.94	2222.2	61.18	10
#16	169.8	779.8	609.0	16.77	953.2	26.24	15
#0	169.8	514.0	344.2	9.48	344.2	9.47	—



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SIEVE ANALYSIS TEST REPORT

TEST NO. 23

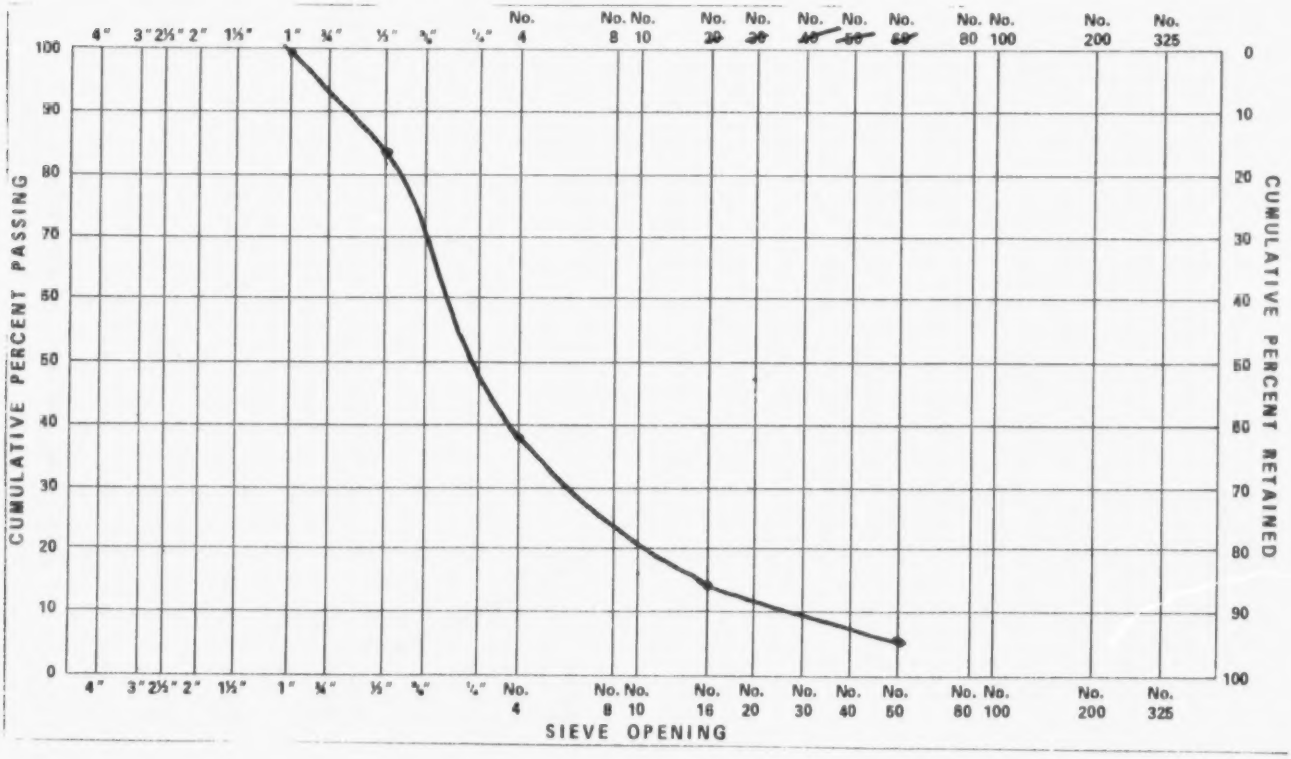
DATE SAMPLE TAKEN 9-24-77

TEST SITE ABMA-SITE A

TEST PERFORMED BY PLL, JOB

SAMPLE IDENTIFICATION KEMMERER COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	169.8	210.1	40.3	0.88	4572.7	100.00	1
1"	169.8	908.1	738.3	16.15	4532.4	99.12	2
½"	169.8	2220.5	2050.7	44.85	3794.1	82.97	5
#4	169.8	1317.9	1148.1	25.11	1743.4	38.12	10
#16	169.8	510.5	340.7	7.45	595.3	13.01	15
#50	169.8	424.4	254.6	5.57	254.6	5.56	—



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SIEVE ANALYSIS TEST REPORT

TEST NO. 24

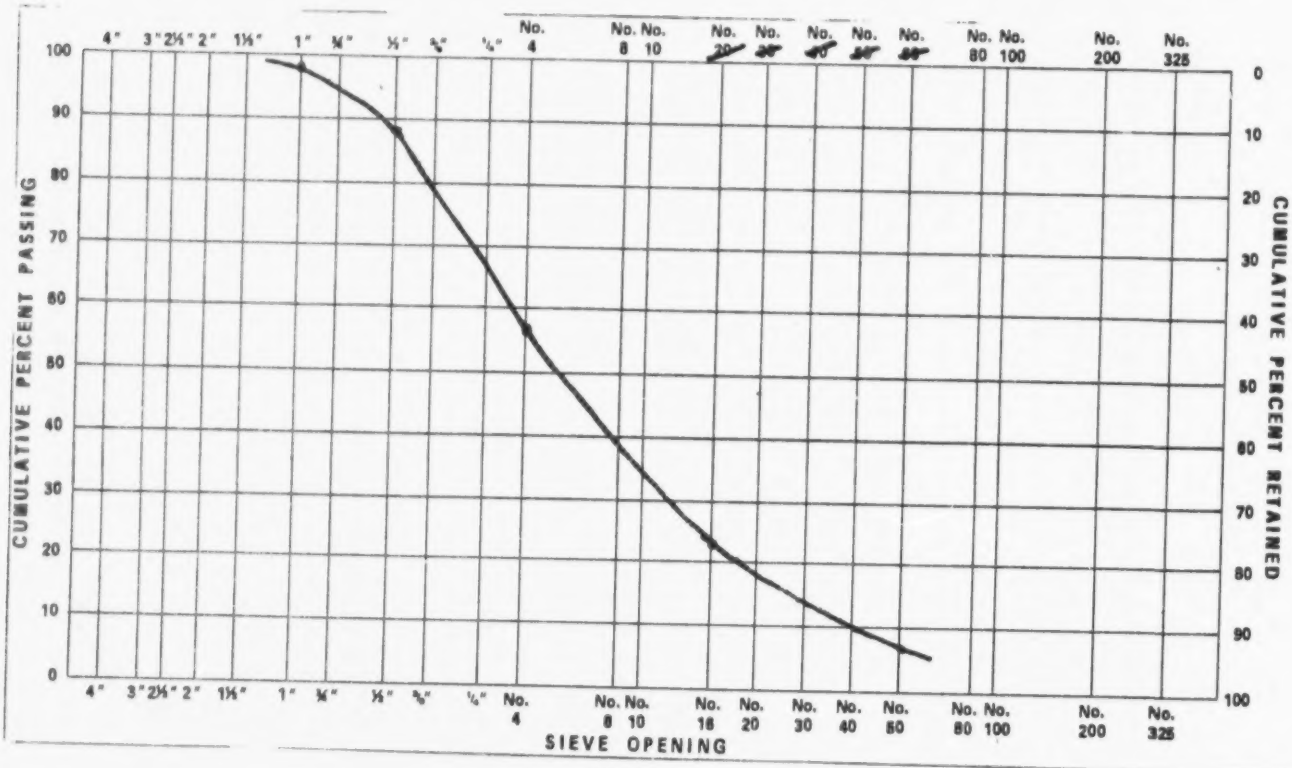
TEST SITE ABMA-SITE A

SAMPLE IDENTIFICATION KEMMERER COAL

DATE SAMPLE TAKEN 9-24-77

TEST PERFORMED BY PLL, JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	169.8	301.4 250.2	112.0	1.80	6226.4	100.00	1
1"	169.8	410.1 576.3	646.8	10.39	6114.4	98.20	2
1/2"	169.8	834.4 1437.0	1931.8	31.03	5467.6	87.81	5
#4	169.8	841.3 1644.4	2146.1	34.47	3535.8	56.78	10
#16	169.8	423.4 855.1	938.9	15.08	1389.7	22.31	15
#50	169.8	620.6	450.8	7.24	450.8	7.23	—



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 26 A

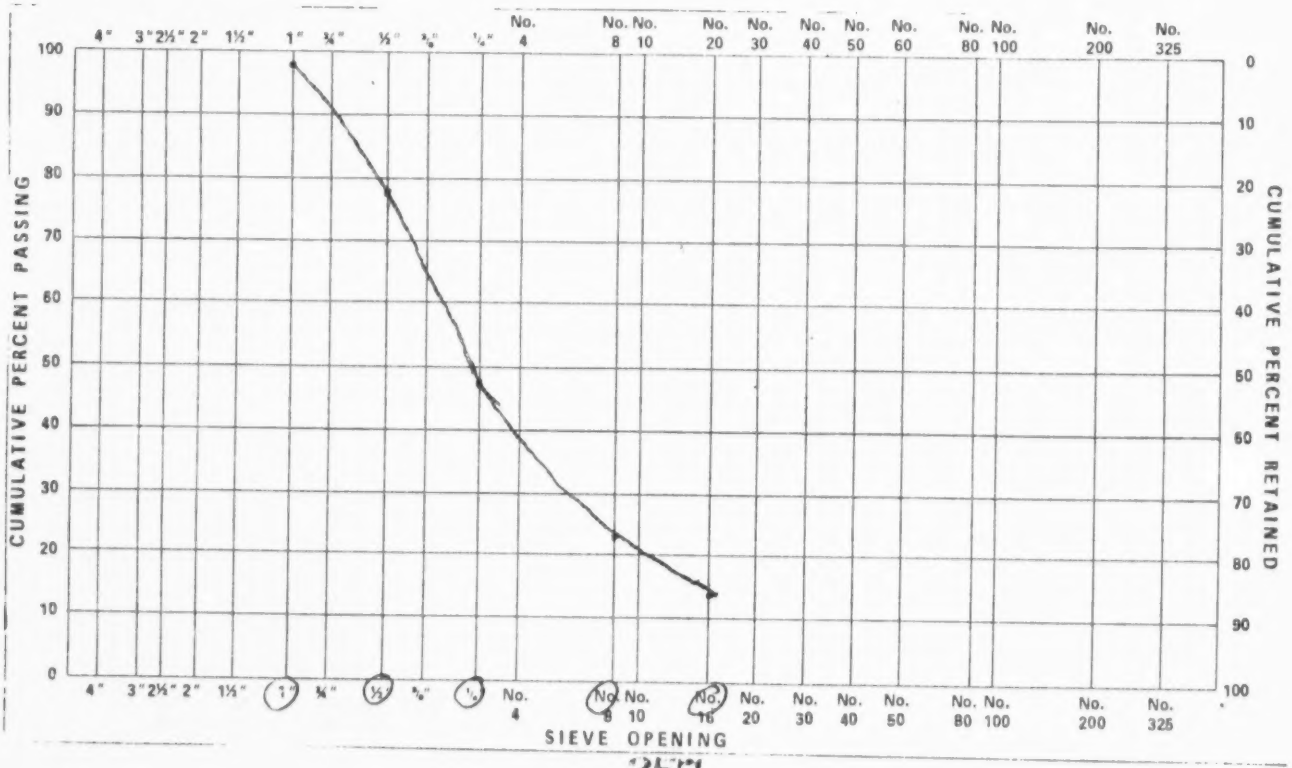
TEST SITE A

SAMPLE IDENTIFICATION Kemmerer Coal

DATE SAMPLE TAKEN 6 Oct 77

TEST PERFORMED BY DSS

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	168.8	260.7 213.1	136.2	2	7715.3	100	1
1"	168.8	1061.5 869.4	1593.3	20	7579.1	98	2
½"	168.8	1368.5 1333.0	2363.9	31	5985.8	78	4
¼"	168.8	952.5 1235.1	1850.0	24	3621.9	47	8
#8	168.8	428.4 587.4	678.2	9	1771.9	23	16
#16	168.8	586.8 844.5	1093.7	14	1093.7	14	—



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 26-B

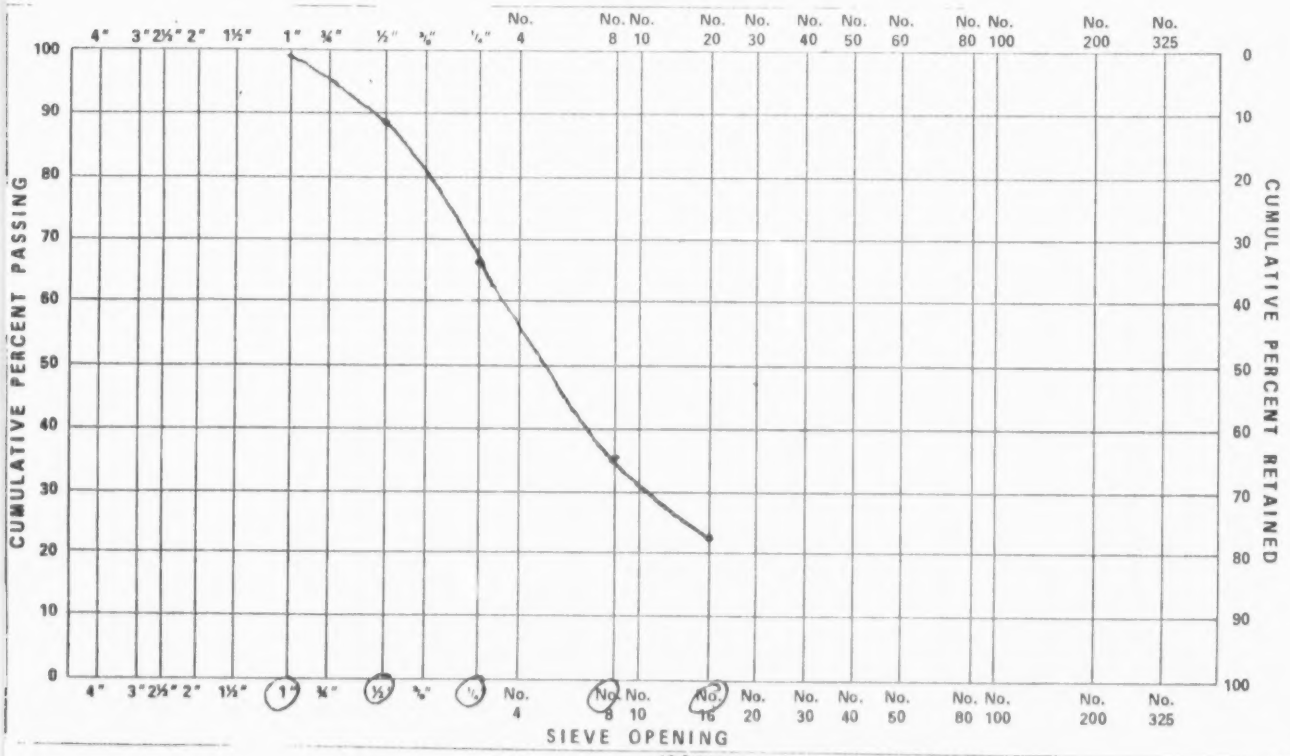
DATE SAMPLE TAKEN 10-06-77

TEST SITE A

TEST PERFORMED BY JB

SAMPLE IDENTIFICATION KEMMERER COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	169.1	220.6 [illegible]8.4	120.8	1	7611.2	100	1
1"	169.1	572.8 535.9	770.5	10	7490.4	99	2
½"	169.1	1022.4 1039.5	1723.7	23	6719.9	89	4
¼"	169.1	1381.9 1293.2	2326.9	31	4996.2	66	8
#8	169.1	709.4 651.8	1022	13	2669.3	35	16
#16	169.1	1053.9 931.6	1647.3	22	1647.3	22	—



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 27

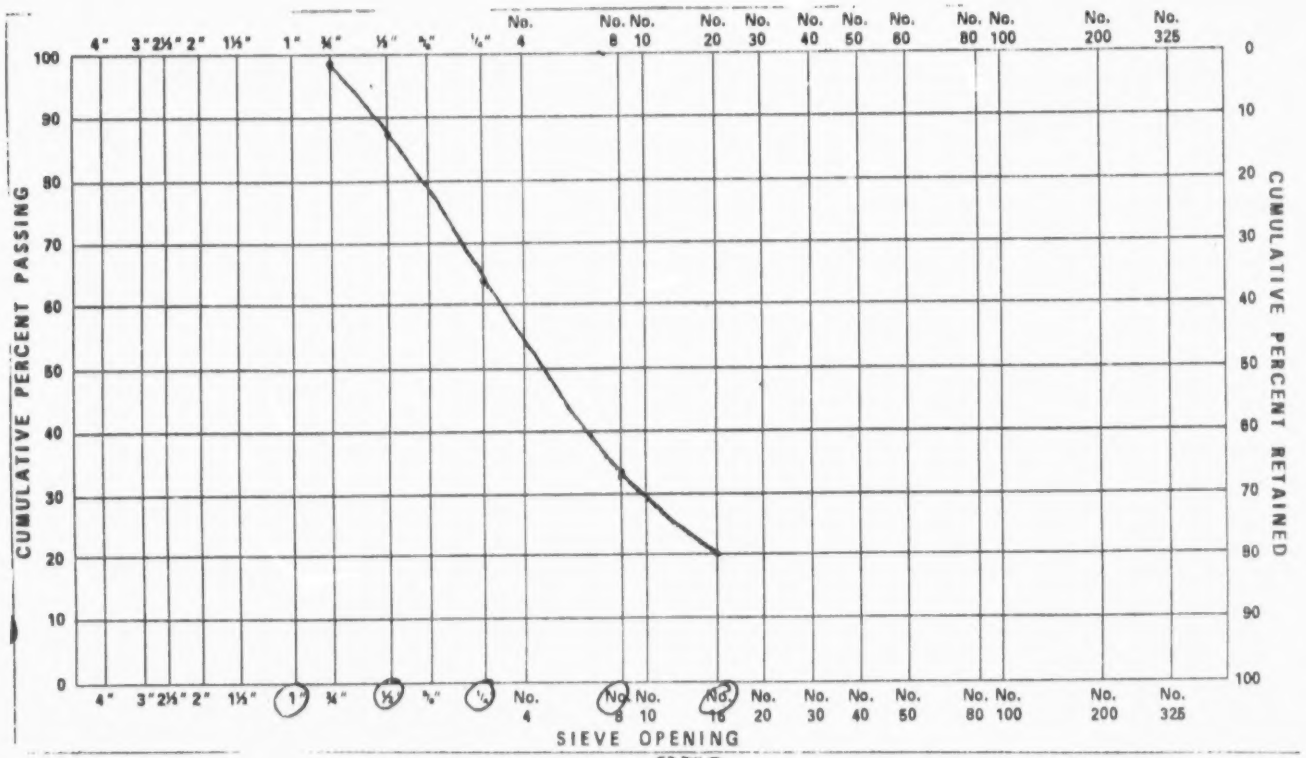
TEST SITE A

SAMPLE IDENTIFICATION KEMMERER COAL

DATE SAMPLE TAKEN 10-08-77

TEST PERFORMED BY JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	168.6	211.5	42.9	1	4328.9	100	1
1"	168.6	647.5	478.9	11	4286	99	2
½"	168.6	1212.4	1042.8	24	3807.1	88	4
¼"	168.6	1494.2	1325.6	31	2763.3	64	8
#8	168.6	743.8	575.2	13	1437.7	33	16
#16	168.6	1031.1	862.5	20	862.5	20	—



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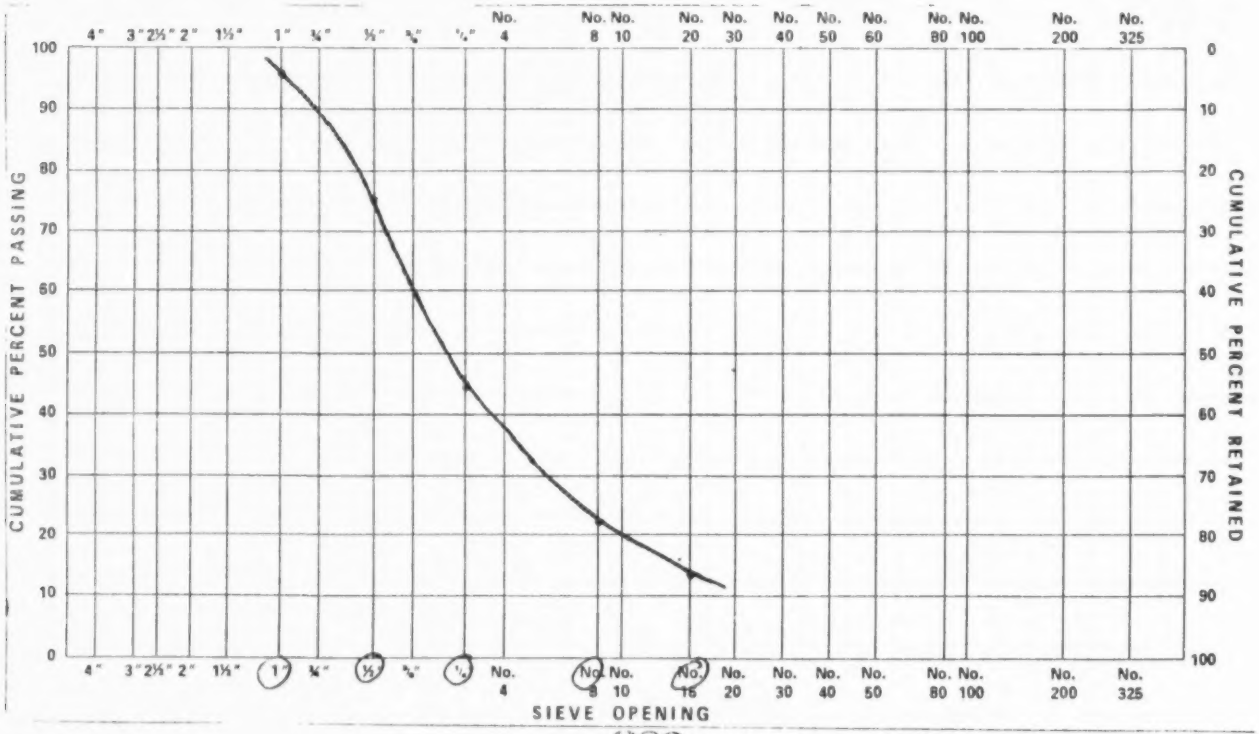
SIEVE ANALYSIS TEST REPORT

TEST NO. 28 DATE SAMPLE TAKEN 10-10-77

TEST SITE A TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION KENNECOTT COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	169.0	514.9	345.9	4.25	8143.2	100.00	1
1"	169.0	1909.5	1740.5	21.37	7797.3	95.75	2
½"	169.0	1739.5 1041.1	2442.6	30.00	6056.8	74.38	4
¼"	169.0	1979.0	1810.0	22.23	3614.2	44.38	8
#8	169.0	881.6	692.6	8.51	1804.2	22.15	16
#16	169.0	1280.6	1111.6	13.65	1111.6	13.64	—



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 29

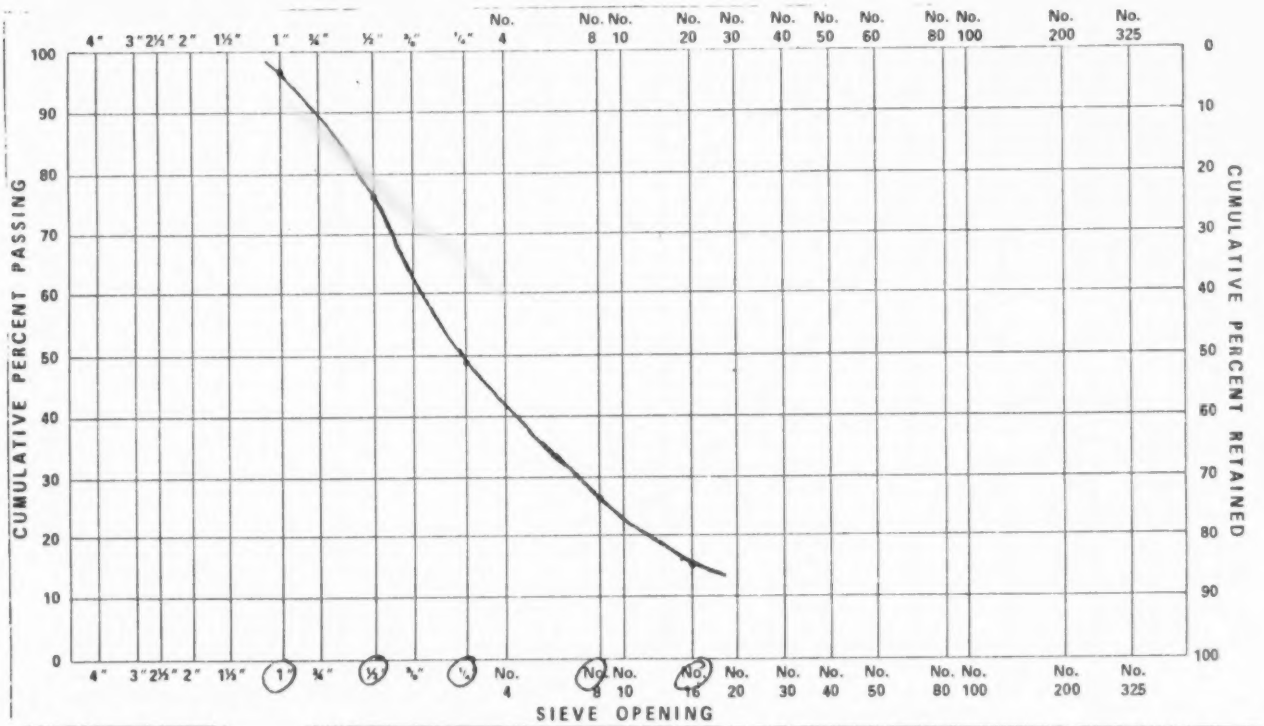
TEST SITE A

SAMPLE IDENTIFICATION KEMMERER COAL

DATE SAMPLE TAKEN 10-10-77

TEST PERFORMED BY VB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	169.0	426.7	257.7	3.37	7656.2	100.00	1
1"	169.0	1739.7	1570.7	20.51	7398.5	96.63	2
½"	169.0	2277.8	2108.8	27.54	5827.8	76.12	4
¼"	169.0	1884.7	1715.7	22.41	3719.0	48.58	8
#8	169.0	967.9	798.9	10.43	2003.3	26.17	16
#16	169.0	1373.4	1204.4	15.73	1204.4	15.74	—



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 30

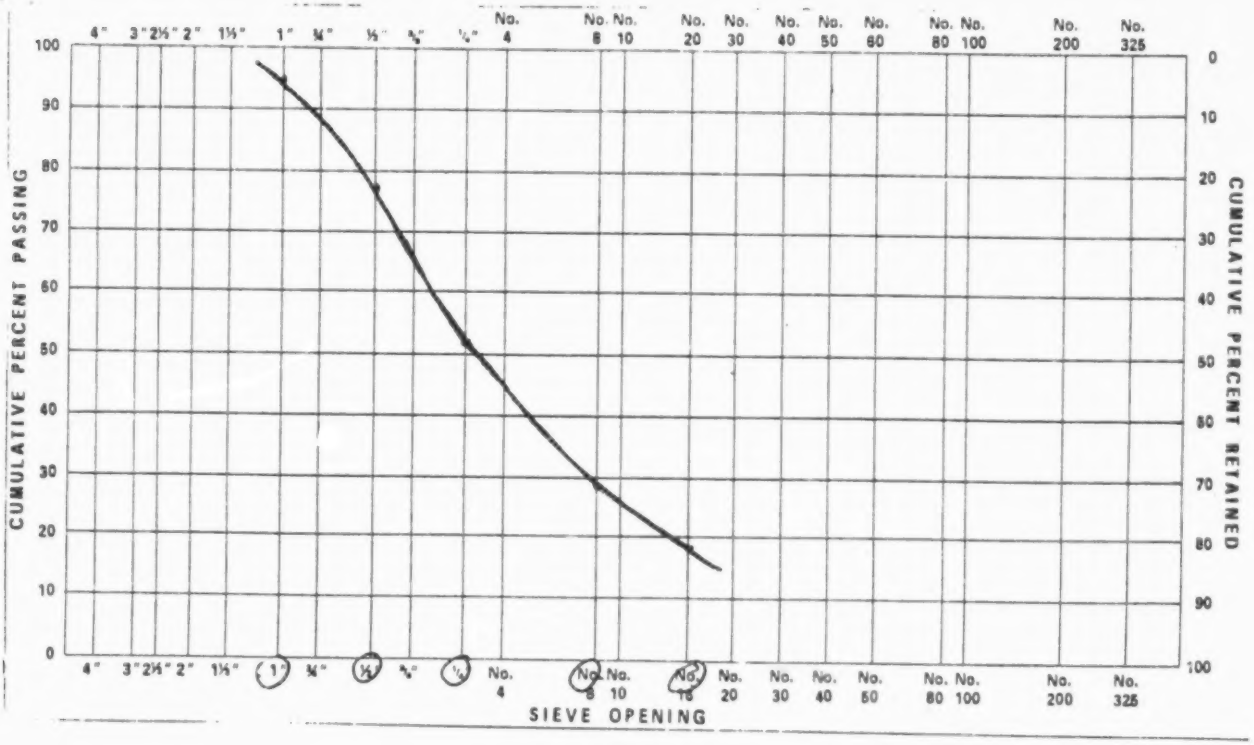
TEST SITE A

SAMPLE IDENTIFICATION KEMMERER COAL

DATE SAMPLE TAKEN 10-13-77

TEST PERFORMED BY JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	168.9	5284	3595	4.93	7294.5	100.00	1
1"	168.9	14780	1309.1	17.95	6935.0	95.07	2
½"	168.9	1993.9	1825.0	25.02	5625.9	77.12	4
¼"	168.9	1897.3	1728.4	23.69	3800.9	52.10	8
#8	168.9	967.6	798.7	10.95	2072.5	28.41	16
#16	168.9	1442.7	1273.8	17.46	1273.8	17.46	16



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KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 32

TEST SITE A

SAMPLE IDENTIFICATION Kemmerer COAL

DATE SAMPLE TAKEN 15 Oct 77

TEST PERFORMED BY RSE

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	168.8	184.6 281.8	128.8	1.48	8708.2	100.00	1
1"	168.8	528.5 506.1	697.0	8.00	8579.4	98.52	2
½"	168.8	1002.0 981.8	1646.2	18.90	7882.4	90.52	4
¼"	168.8	1628.1 1600.4	2890.9	33.20	6236.2	71.62	8
#8	168.8	850.3 812.4	1325.1	15.22	3345.3	38.42	16
#16	168.8	1202.1 1155.7	2020.2	23.20	2020.2	23.20	

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KVB

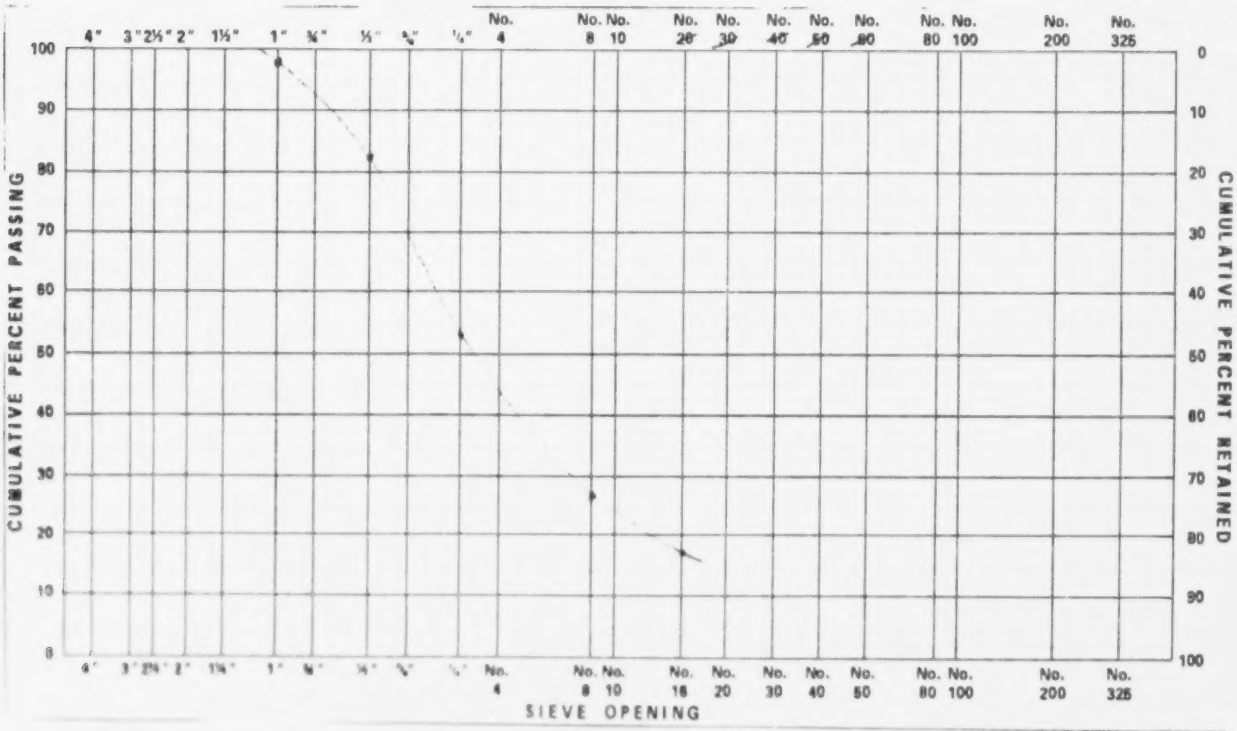
SIEVE ANALYSIS TEST REPORT

TEST NO. 34 DATE SAMPLE TAKEN 10-29-77

TEST SITE A TEST PERFORMED BY [illegible]

SAMPLE IDENTIFICATION CONSOLIDATION COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
1½	169.0	207.6 319.6	187.2	1.84	10,260.8	100.00	1
1"	169.0	626.6 1361.8	1650.4	16.08	10,071.6	98.16	2
½"	169.0	1032.6 2252.7	2947.3	28.72	8,421.2	82.08	4
#4	1690	1118.4 1895.7	2676.1	26.08	5,473.9	53.36	8
#8	1690	525.5 893.8	1081.3	10.54	2,797.8	27.28	16
#16	1690	709.7 1348.8	1716.5	16.73	1,716.5	16.74	16



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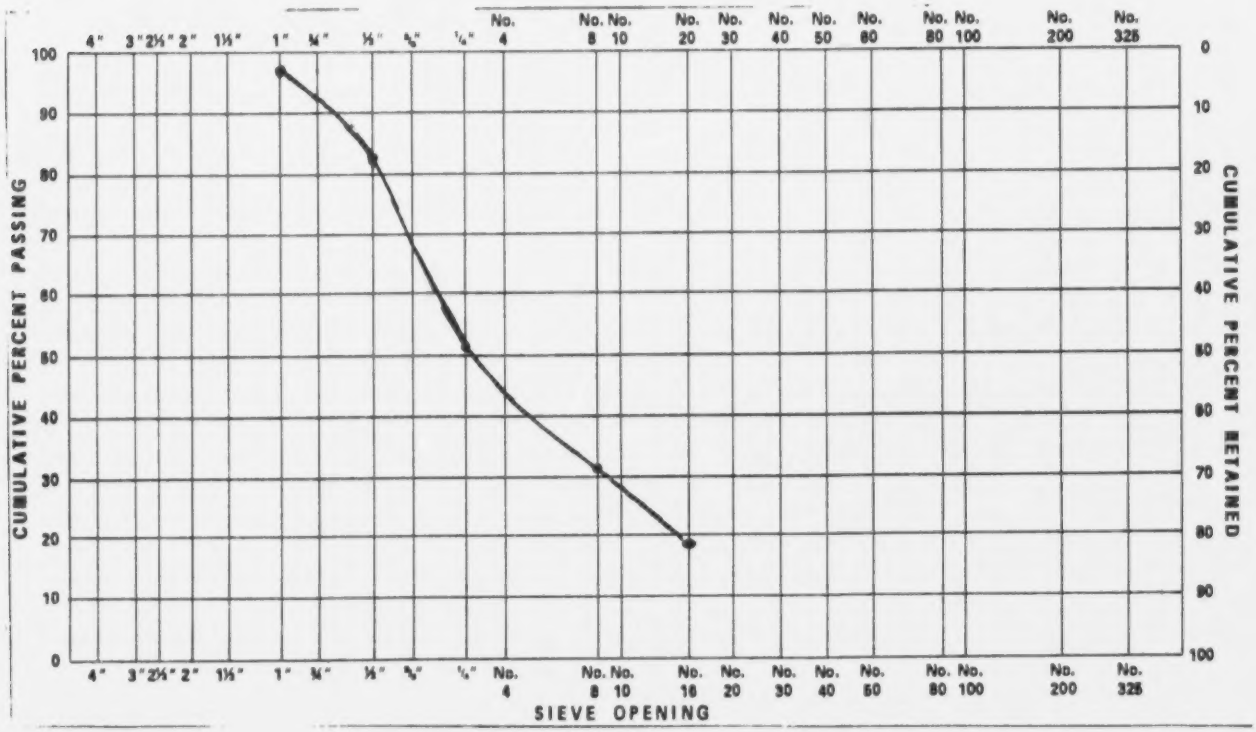
SIEVE ANALYSIS TEST REPORT

TEST NO. 35 DATE SAMPLE TAKEN 10-30-77

TEST SITE A TEST PERFORMED BY VDE

SAMPLE IDENTIFICATION CONSOLIDATION COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	169.0	351.9	182.9	2.3	7954.7	100.0	1
1"	169.0	1382.8	1213.8	15.3	7771.8	97.7	2
1/2"	169.0	966.4 1587.4	2451.8	30.8	6558.0	82.4	4
#4	169.0	1768.2	1594.2	20.1	4106.2	51.6	8
#8	169.0	1145.6	976.6	12.3	2507.0	31.5	16
#16	169.0	1699.4	1530.4	19.2	1530.4	19.2	—



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SIEVE ANALYSIS TEST REPORT

TEST NO. 36

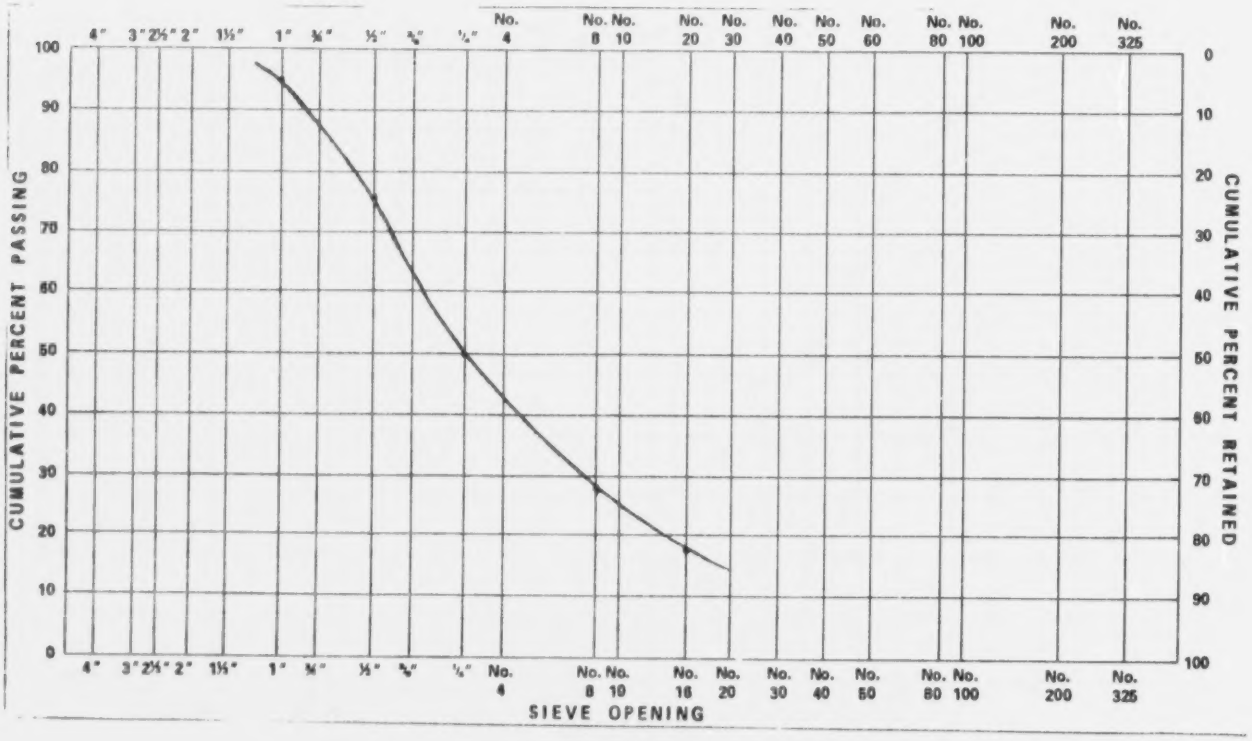
TEST SITE A

SAMPLE IDENTIFICATION CONSOLIDATION COAL

DATE SAMPLE TAKEN 11-1-77

TEST PERFORMED BY [illegible]

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	169.0	[illegible]	286.9	4.90	5849.4	100.00	1
1"	169.0	1345.7	1176.7	20.12	5562.5	95.10	2
½"	169.0	1646.8	1477.8	25.26	4385.8	74.98	4
¼"	169.0	1491.6	1322.6	22.61	2908.0	49.72	8
#8	169.0	764.4	595.4	10.18	1585.4	27.11	16
#16	169.0	1159.0	990.0	16.92	990.0	16.93	16



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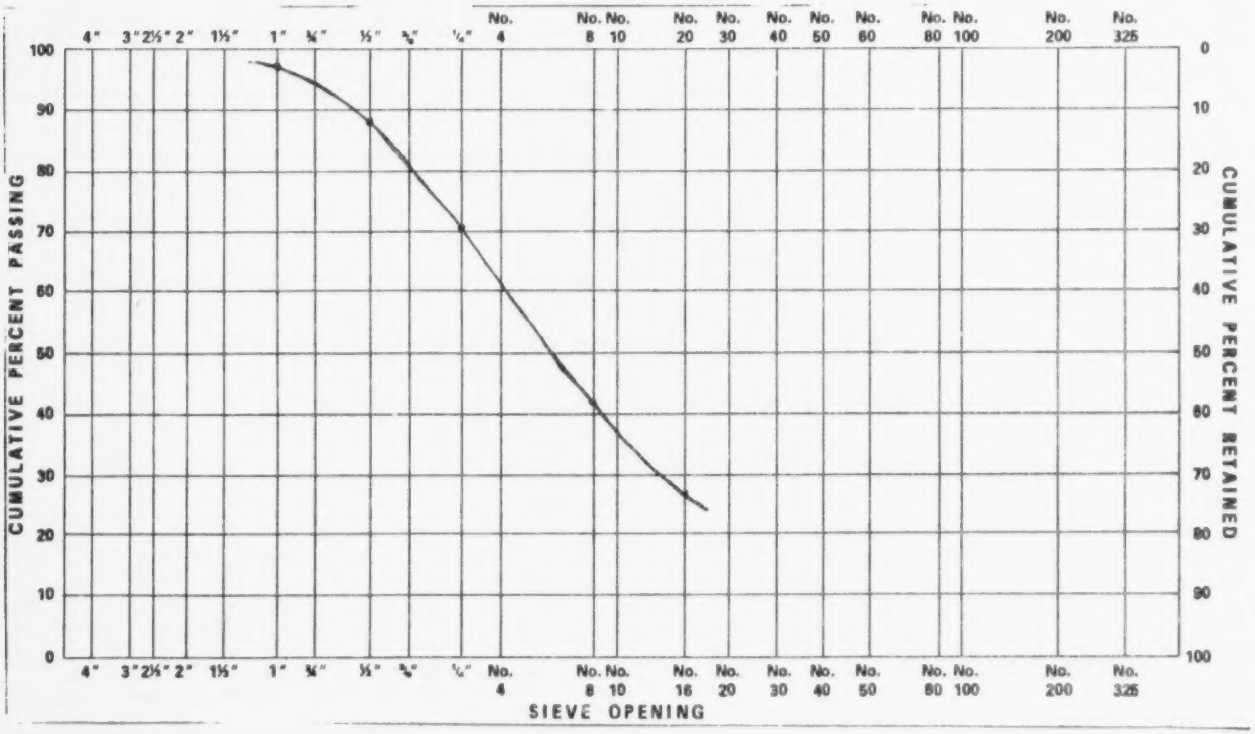
SIEVE ANALYSIS TEST REPORT

TEST NO. 7 DATE SAMPLE TAKEN 11-1-77

TEST SITE A TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION CONSOLIDATION COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	169.0	329.2	160.2	3.02	5305.0	100.00	1
1"	169.0	632.8	463.8	8.74	5144.8	96.98	2
½"	169.0	1130.0	961.0	18.11	4681.0	88.24	4
¼"	169.0	1672.8	1503.8	28.35	3720.0	70.13	8
#8	169.0	977.9	808.9	15.25	2216.2	41.78	16
#16	169.0	1576.3	1407.3	26.53	1407.3	26.53	16



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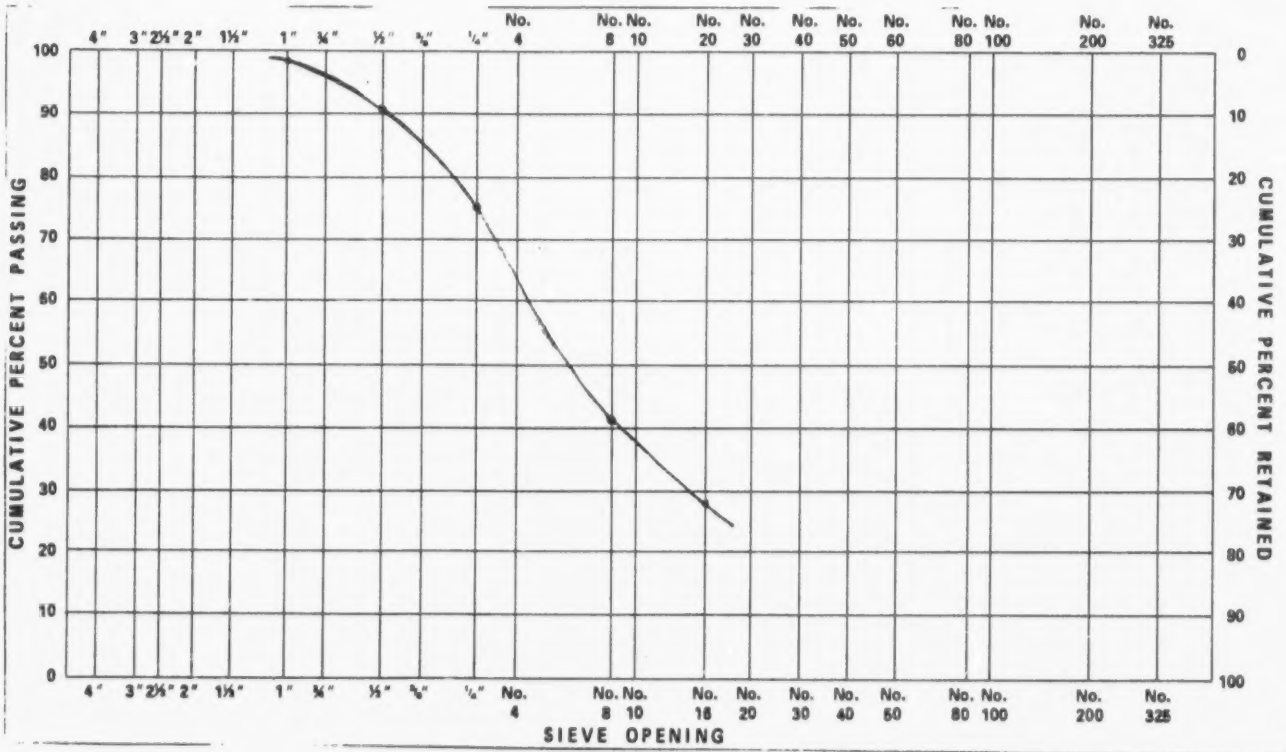
SIEVE ANALYSIS TEST REPORT

TEST NO. 38 DATE SAMPLE TAKEN 11-2-77

TEST SITE A TEST PERFORMED BY 103

SAMPLE IDENTIFICATION CONSOLIDATION COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	169.0	268.2	99.2	1.81	5479.0	100.00	
1"	169.0	595.2	426.2	7.78	5379.8	98.19	2
½"	169.0	1219.7	880.7	16.07	4953.6	90.41	4
¼"	169.0	1993.8	1824.8	33.31	4072.9	74.34	8
#8	169.0	1139.2	715.6	13.06	2248.1	41.03	16
#16	169.0	1701.5	1532.5	27.97	1532.5	27.97	16



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KVB

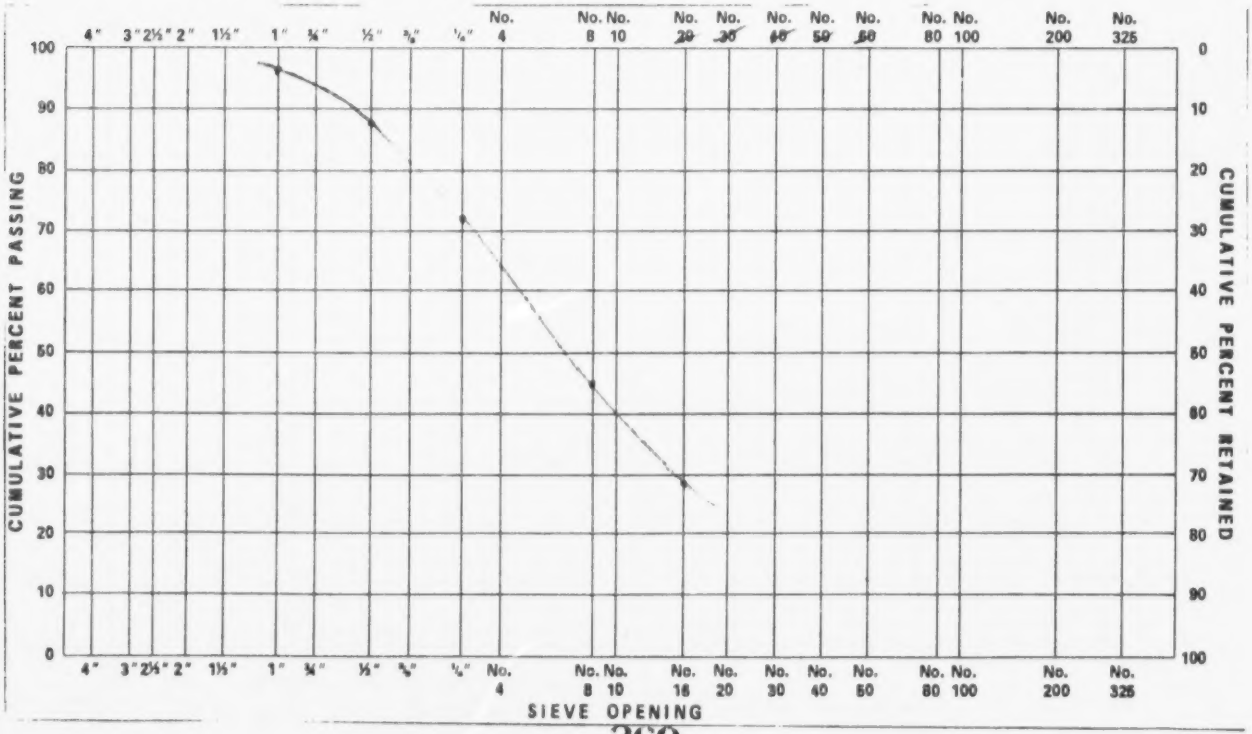
SIEVE ANALYSIS TEST REPORT

TEST NO. 39 DATE SAMPLE TAKEN 11-2-77

TEST SITE A TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION CONSOLIDATION COAL

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	169.0	403.5	234.5	3.48	6,731.9	100.00	1
1"	169.0	782.8	[illegible]	[illegible]	[illegible]	96.52	2
½"	169.0	1197.1	1028.1	15.27	[illegible]	27.40	4
¼"	169.0	[illegible]	1869.3	27.77	4855.5	72.13	8
#8	169.0	1266.1	1097.1	16.30	2,986.2	44.36	16
#16	169.0	2058.1	1889.1	[illegible]	1889.1	2806	16



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SIEVE ANALYSIS TEST REPORT

TEST NO. 40

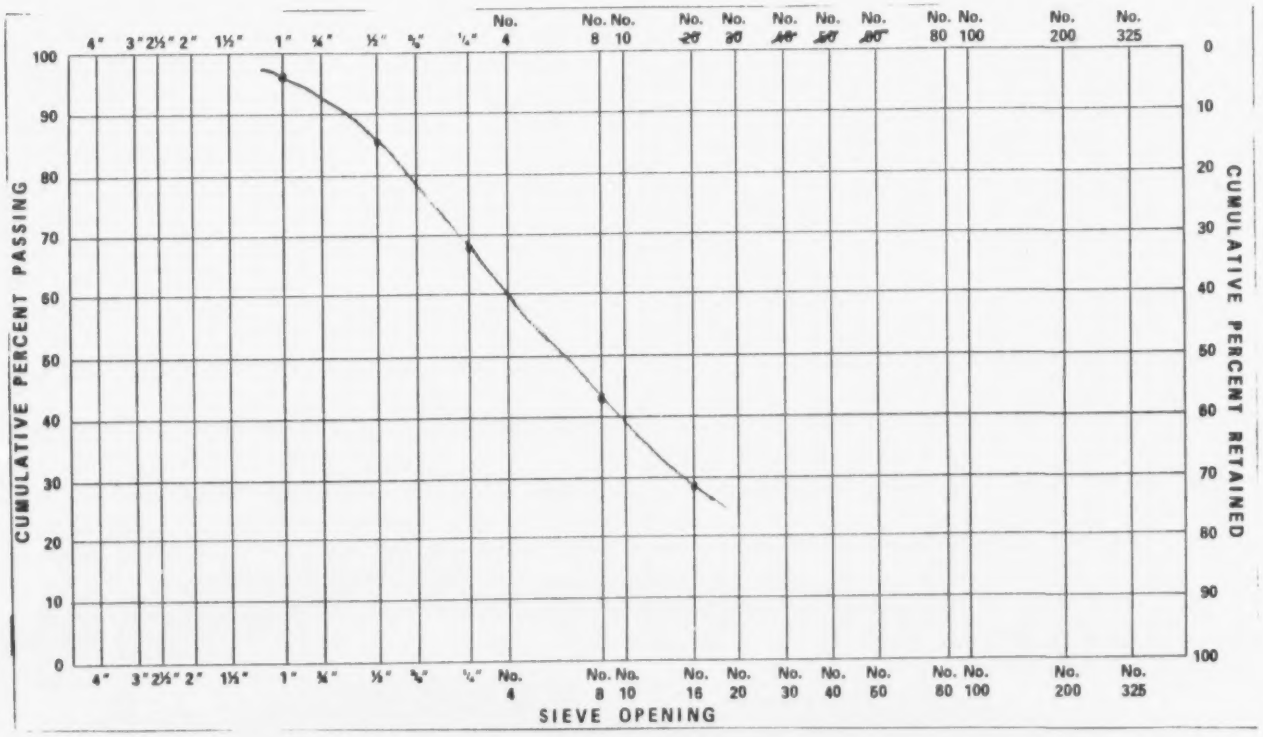
TEST SITE A

SAMPLE IDENTIFICATION KEMMERER

DATE SAMPLE TAKEN 11-11-77

TEST PERFORMED BY JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	168.7	507.6	338.9	3.50	9673.7	100.00	1
1"	168.7	1176.5	1007.8	10.42	9334.8	96.50	2
½"	168.7	1916.1	1747.4	18.06	8327.0	86.08	4
¼"	168.7	2582.1	2413.4	24.95	6579.6	68.02	8
#8	1687	1579.8	1411.1	14.59	4166.2	43.07	16
#16	1687	2065.9 1026.6	2755.1	28.48	2755.1	28.48	16



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